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Automobile Magazine

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VOL. II

MAY 1900

No. 2

The United States Industrial Publishing Company
21 State Street New York City U. S. A.

“Locomobile”



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 London.







Mr. George F. Chamberlin,
Vice-President,
President pro tem. of the Automobile Club of America

The Automobile MAGAZINE

VOL. 11

MAY 1900

NO. 2

Doings of the Automobile Club of America

AT the opening of the active automobile season, we think it will interest our readers to learn about the doings of the Automobile Club of America. We will in future give every month a like synopsis of the activity of this young and vigorous institution, and at some later date will present the history of the club from its inception. Under the guidance of Mr. George F. Chamberlin, Vice-President and acting President; Capt. Homer W. Hedge, the Secretary, and Mr. Whitney Lyon, the founder, the club has already developed into one of the foremost New York clubs.

It has made itself felt as a powerful organization, not only in New York City and State, but even throughout the United States, by fostering a new national industry and by its enterprise in initiating a new phase of the "good roads" movement in the proposed creation of a system of national highways, beginning with a transcontinental boulevard from the Atlantic to the Pacific. To Mr. John Brisben Walker, the eminent editor and publisher, also a member of the club, is due the credit for the first conception of this giant project.

The great event of the year, and one that may have most beneficent and far-reaching consequences, was the dinner given by the club in the Astor gallery of the Waldorf-Astoria on the evening of April 2, when a number of distinguished guests were invited to meet Major-General Nelson A. Miles of the United States army and the other members of the

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commission appointed to consider the subject of a national highway from the Atlantic to the Pacific. The dinner was the first regular affair of the kind given by the club. Vice-President Chamberlin presided, and with him at the head table sat General Miles and Francis E. Stanley, Newton, Mass.; Colonel Peter Michie, United States Military Academy; Colonel Richard L. Hoxie, United States Engineer Corps; Colonel Samuel E. Tillman, United States Military Academy, and Colonel John Jacob Astor.

Among others present were ex-Mayor William L. Strong, Colonel Albert A. Pope, the

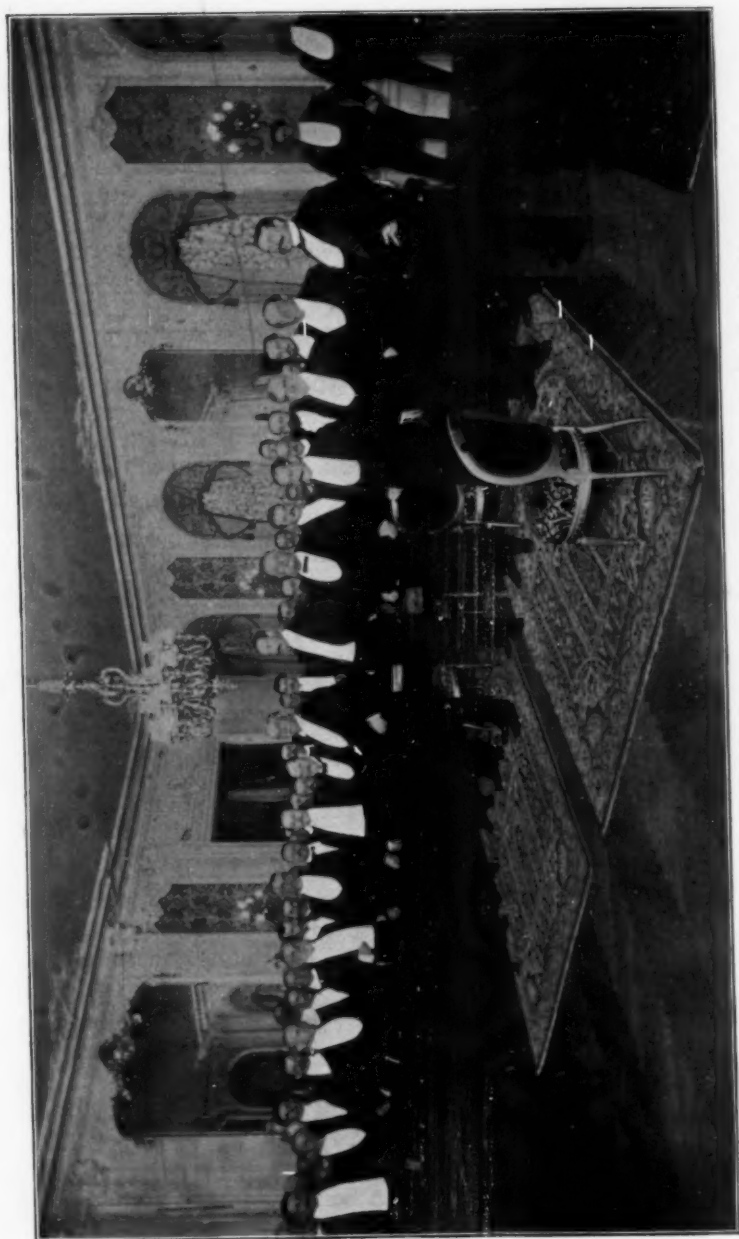


Cap. Homer W. Hedge,
Secretary of the Club



Mr. Whitney Lyon,
Founder of the Club

Rev. Dr. Henry M. Sanders, Julian Hawthorne, Isaac B. Potter, A. R. Shattuck, General George Moore Smith, Major P. B. Strong, William Leary, Dave H. Morris, John H. Flagler, Albert C. Bostwick, Leonce Blanchet, V. Everit Macy, George Isham Scott, Edwin W. Adams, J. O. Jimenes, Jefferson M. Seligman, E. E. Schwarzkopf, J. S. Bache, Amzi L. Barber, W. H. Johnson, Walter E. Frew, S. S. Wheeler, A. R. Hawley, Whitney Lyon, J. M. Ceballos, E. S. Jaffray, Charles J. Canda, the Rev. E. N. Potter, Rudolph Walker, David S. Walker, P. Farrelly, Colonel Edgar Bass, Charles R. Flint and Stephen Farrelly.



The National Commission for the Construction of the Transcontinental Boulevard

By courtesy of the *N. Y. Tribune*

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Mr. A. R. Shattuck,
Chairman of Good Roads and Library Committee

for Good Roads.' When, therefore, it was proposed that the first dinner of the Automobile Club of America should be in honor of the distinguished gentlemen composing the Commission who are to make a report on the project of a transcontinental highway, every member felt that our association, of all others, was most vitally interested in the magnificent enterprise. As early in our country's history as 1800 a small beginning was made in the actual construction of a system of National highways. But the advent of the railroad and subsequent financial difficulties put an end to the splendid plans

Mr. Chamberlin, in his introductory remarks, said:

"This club has always, from its very organization, recognized that the future use of the self-propelled pleasure vehicle in this country will be largely a question of good roads. The charter of this club expressly provides that one of its principal objects and purposes shall be 'to promote and encourage in all ways the construction of good roads and the development and improvement of highways.' The club is proud that it has been able already to awaken some public sentiment along this line, its first official publication having been entitled 'A Plea



Mr. Albert C. Bostwick,
Chairman Runs, Tours and Contests Committee

Doings of the Automobile Club in America



S. T. Davis, Jr.,
The King of the Roads

of our forefathers. The year 1900 now witnesses the beginning of a new movement toward the realization of the vast and magnificent project which we are to informally discuss this evening."

Mr. Chamberlin then introduced Gen. Miles as the head of the Commission. Gen. Miles was received with cheers and the com-

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Mr. C. G. Dinsmore,
Of the Committee on Foreign Relations,
Delegate to the Paris Races and Congress

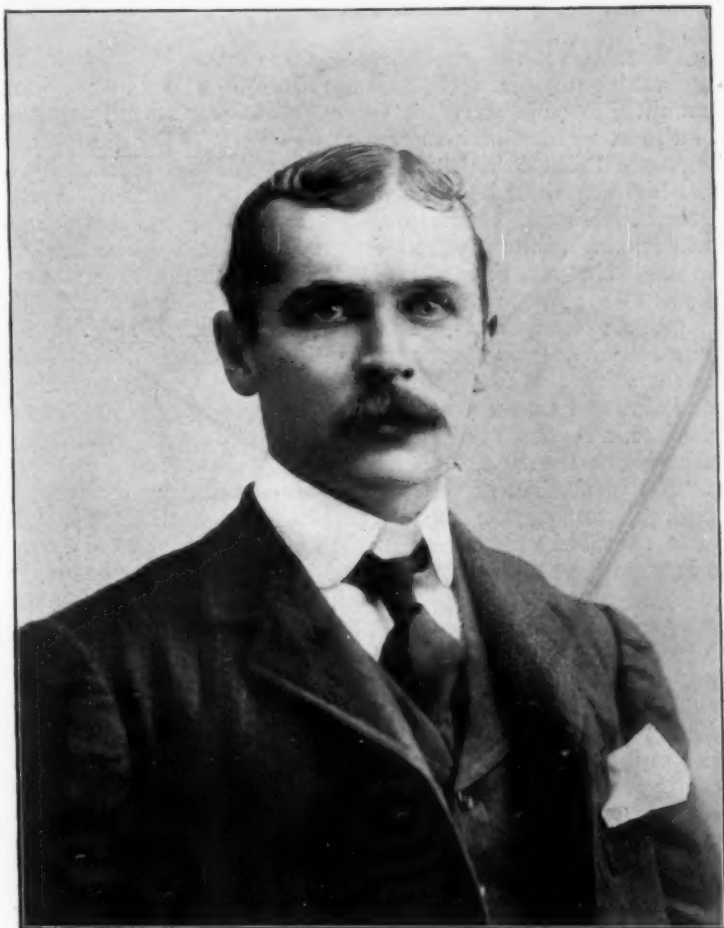
pany rose to drink to his health. Gen. Miles said that "Every one who knows the history of the country knows that the great continental railways were not built altogether for commerce, but to develop the ties that bind the West to the East. The great continental railways were constructed to establish order, and to provide that each State should be a part of one great country; they were built not alone for commercial interests but for the higher, grander and glorious purpose of welding the East to the West. The Commission had devoted itself to considering the best routes for connecting the great centres of activity with each

other. The Commission had thought of a highway along the Atlantic Coast from a point as far north as Portland, Me., to as far south as New Orleans or St. Augustine. Then branching at some important point from this road, the Commissioner had thought of a highway which would extend to the Pacific Coast. Personally he was inclined to agree with those who contended that it should start at New York, inasmuch as that city was the metropolis of the East. The route of the road should go through Chicago, then it might strike St. Louis, continuing through Kansas City or Omaha, over the mountains to Ogden and then to San Francisco. It will be only a short time before you will be able to ride on your bicycle or automobile from coast to coast."

Ex-Mayor Strong urged that the State of New York build a first-class highway from New York City to Buffalo at its own expense, and said that it would be of particular value to farming interests.

Isaac B. Potter, former President of the League of American Wheelmen, spoke of the interests of wheelmen in the movement.

Doings of the Automobile Club in America



Mr. George Isham Scott,
Of the Board of Governors

Col. Pope, the founder of the good-roads movement in the United States, told about the success of good roads in Massachusetts and said that New York, the richest State, had about the poorest roads. He predicted an enormous development for the automobile in the near future. He reported the following

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resolutions, which were seconded by Col. Astor, and unanimously adopted:

"That the route presenting the most feasible line for a National highway from the Atlantic to the Pacific seems to your Committee to be between the fortieth and forty-second parallels of latitude. This embraces Boston, from which the route could be stretched east to Portland, Me., then Albany, reached by a great highway from New York, Philadelphia, Baltimore, Washington, Richmond, Charleston, Savannah and St. Augustine. From Albany running west through Syracuse, Rochester, Buffalo and Niagara Falls; through Erie, Penn.; Cleveland and Toledo, Ohio; Adrian and Coldwater, Mich.; Elkhart and South Bend, Ind.; from Chicago, Ill., to Davenport, Des Moines and Council Bluffs, Iowa; through Omaha, Lincoln and Hastings, Neb.; starting across the Rocky Mountains at Denver, reaching Salt Lake, and thence southwestwardly to Sacramento and San Francisco, a southern line reaching thence to Los Angeles, and a northerly one Portland, Ore., and Seattle, Wash.

"*Resolved*, That in view of the military importance of such a highway, and of the advantages to those sections through which it would be built, and, furthermore, in view of the example in good road building it would give to the people of twenty-five States and Territories, through which it would pass, the matter be brought prominently to the attention of the people of the twenty-five States and Territories concerned, in order that Congress may be petitioned to authorize the preliminary surveys required for such National highway; providing, if possible, for the completion of the survey of the section between Boston and Chicago the first year, that between Chicago and Omaha the second year, that between New York and St. Augustine the third year and the remaining sections within the following year.

"*Resolved*, That it be suggested to the petitioners to prepare the completion of the National highway by an appropriation for one-third the expenditure required from the Congress of the United States, one-third by the States for those portions lying within their respective boundaries, and one-third by the counties, townships and cities through which the road shall pass, while the owners of all property benefited be asked to donate the right of way.

"It is the further opinion of the Committee that, in view of the rapidity of motion which science is substituting for the slower forms of roadway travel, and in view of conditions which many recent tests upon the great highways of France and England have already made clear, two points should be kept in mind with reference to construction—first, ample width, and, second,



The Bohemian Beefsteak Dinner of the Automobile Club

By courtesy of the *N. Y. Herald*

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the avoidance of curves. One hundred and twenty feet is shown in the boulevard which Massachusetts has built leading out of Boston, to be not too great a width. One-half this width might be built in the first instance, but by all means should the entire right-of-way be secured. The impossibility of avoiding collisions between carriages moving rapidly around curves calls attention to the necessity for long, straight lines in a way that did not present itself in the earlier days of highway engineering."

Among the other speakers were Col. Astor, Julian Hawthorne, M. Verdery, and the Rev. Dr. Henry M. Saunders.

The automobile Club of America will soon have to elect a new President and a new Vice-President. Mr. G. F. Chamberlin, the retiring Vice-President, has been urged to accept the Presidency, but he feels that he cannot give the time demanded for the duties of the office. There is a unanimous sentiment in favor of Col. John Jacob Astor, but he also has declined, although there are hopes that he may be induced to reconsider his decision. Mr. A. R. Shattuck and Gen. George Moore Smith are prominently mentioned, and it is thought that the Vice-Presidency may go either to Mr. George Isham Scott or Mr. S. T. Davis, Jr.

Many of the members feel that there is too much racing about the runs of the club, road-racing not being in accord with the true objects of the organization, while in this country it is also strongly disapproved by public sentiment.

In one of the recent runs of the club, Mr. S. T. Davis, Jr., made the distance with his locomobile from the Ardsley Casino to Central Bridge, 17½ miles, in 34 minutes. He was also the first to arrive at the Casino, starting from the Waldorf-Astoria at 10 o'clock and reaching that point at 11.17.

The club lectures are a valuable feature. On the evening of April 7 Mr. C. J. Field, Chairman of the Technical Committee, addressed the members and their friends with a practical talk on automobiles. A notable talk was given on the evening of April 28 by Prof. R. H. Thurston, Director of the Schools of Engineering and of Mechanic Arts at Cornell University.

One of the club's most enjoyable occasions was the Bohemian beefsteak dinner, organized by Mr. Whitney Lyon, the father of the club, and given in informal fashion. The decorations, relating to the automobile, were grotesquely humorous. The speaking was off-hand and Mr. Albert R. Shattuck, Chairman of the Good-roads Committee, told about his Committee's work.

Mr. Clarence Gray Dinsmore has been elected as delegate to represent the club at the International Automobile Races at Paris, with Mr. John H. Flagler as vice-delegate.

The Automobile in Society

By William E. Baldwin

SOCIETY people have taken up the automobile to an extent that was not expected a year ago. Automobilism has become a fad with the wealthy and more exclusive classes, and the high-stepping horses which formerly crew My Lady's carriage are in despair, for even the society women have fallen victims to the charms of the machines which carry them smoothly and speedily over the roads, at a pace that would kill the average horse.

Society is not only taking up the automobile in town, but at the various country places this summer there will be any quantity of automobiles. Newport and Lenox took them up to some extent last summer, and the automobile parade and the obstacle contest at the former place were the chief events of the season. The Newport automobilists are already planning a series of similar affairs for the coming season.

One of the most prominent of the fashionable automobilists is Mr. W. K. Vanderbilt, Jr. He was one of the first of the society set to purchase a carriage, and he had all sorts of fun learning how to operate it. Some of his adventures at Newport were the talk of all society, but Mr. Vanderbilt, persevering in spite of various runaways, finally mastered the machine. It is related that on one occasion while going down a hill near Newport, he became alarmed at the extreme speed he was making, and put on the brakes too suddenly. The result was that the automobile developed qualities of an acrobatic nature that Mr. Vanderbilt never before suspected, and turned what is described as a complete revolution in the air. Mr. Vanderbilt was thrown some distance, and when the automobile landed from its eccentric flight it carefully avoided hitting the prostrate young multi-millionaire.

Some of the other young society men in Newport had similar adventures, but as an automobile is not a difficult machine to handle, after you have had a little experience, they soon had their carriages buzzing about the roads in the vicinity without accidents. Mr. Honoré Palmer and Mr. Potter Palmer, sons of Mr. and Mrs. Potter Palmer, of Chicago, are both automobilists, and Mr. Harry Lehr, although not an automobile owner, often bor-

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rowed machines of his friends and became an expert in a short time.

New York society women who spend their summers at Newport are to take up automobilism this season, and Mrs. Stuyvesant Fish is taking lessons now in order to be able to handle her carriage on Bellevue avenue without mishap. Mrs. John Jacob Astor, who is now abroad, is another woman who is going to take up the sport, and Mrs. Harry Payne Whitney has been learning from her husband how to operate the machine. Mrs. Hermann Oelrichs, not to be outdone by her associates, will also have her own automobile.

The Automobile Club of America has done much to bring automobilism to the attention of society. While the membership of this club is not confined exclusively to society men, many young clubmen, and others who have wealth and position, are included within its ranks. The Automobile Club is an organization which shows true sportsmanship in its methods, and it is interesting to note that some of its most prominent spirits are society men.

Mr. David Wolfe Bishop, son of Mr. David W. Bishop, of No. 11 Madison avenue, is an enthusiastic member of the club. He was the pioneer automobilist of the Lenox set, and introduced the De Dion motor tricycle to the summer colony in the Berkshires. Mr. Bishop did all kinds of difficult work in the Berkshires, and in hill climbing especially made many records. His brother, Mr. Cortlandt Field Bishop, has a similar machine, and they made many trips last summer in company. Mr. Bishop now has a gasoline carriage, and takes part in all of the club runs, his guest at a recent run being Baron Hermann, of the German Embassy at Washington.

Mr. Albert C. Bostwick, Chairman of the Runs Committee of the Automobile Club of America, is another young society man who has gone in extensively for automobilism. He has several carriages and is enterprising and sporty. He is the son of the late Jabez Bostwick, who amassed a large fortune in Standard Oil. Young Bostwick has a charming home at No. 8 East Sixty-third street, and recently married Miss Marie L. Stokes, one of the handsomest young women in New York society.

Col. John Jacob Astor is another prominent member of the Automobile Club of America, and it is expected that he will soon assume a much more important part in the affairs of the club than in the past few months. He is a careful automobilist, and has been abroad learning from the experts of the other side many things which will come in handy in the future.

The Automobile in Society

Mr. Harry Payne Whitney, who married Miss Gertrude Vanderbilt, is an enthusiastic automobilist, and did considerable work at Newport last season, sharing with Mr. W. K. Vanderbilt, Jr., in some of his extraordinary adventures. Mr. Whitney, who sometimes visits at his father's immense estate on October Mountain, near Lenox, will take an automobile with him next summer into the Berkshires, and will try a little rough work.

Mr. George Isham Scott, who has recently returned from Europe, and who is a prominent member of the English and French Automobile Club, is also a member of the Automobile Club of America, his favorite machine appearing to be a De Dion tricycle. He is reputed as one of our foremost automobilists.

Mr. Whitney Lyon, in a big automobile, is always on hand at the various meets of the club, and frequently takes out large parties on his trap. He is one of the pioneers of automobilism in New York, and was one of the men who tested the ordinance preventing the use of automobiles in Central Park.

Mr. Albert R. Shattuck, of No. 19 Washington Square, North, is another society man who is interested in automobilism, and he is out nearly every day. He is identified with the Lenox set, and is a prominent member of the Metropolitan and other fashionable clubs in New York.

Mr. J. Egmont Schermerhorn is another member of the Lenox set who has gone in extensively for automobilism, and this summer will, no doubt, take his automobile with him to the Berkshires. Mr. Schermerhorn has long been prominent in society in New York, and his wife (formerly Miss Kate L. Cotting) is also becoming interested in the sport. Mr. Schermerhorn lives at No. 25 East Seventy-ninth street, where he has a magnificent house. He is a member of the Metropolitan, Knickerbocker, University, Calumet, New York and other fashionable clubs.

Although Dr. W. Seward Webb has long been a member of the Coaching Club, and is one of the most prominent horsemen in this country, he is also broad minded enough to see the possibilities of the automobile, and has recently become a member of the Automobile Club of America. Dr. Webb has a lot of the finest coach horses in this country at his place, Shelburne Farms, in Vermont, and is one of the most expert whips among the amateur element. He is now seriously considering giving up driving for automobilism, and is to have several automobiles on hand for the use of the guests who visit him at his country place.

Mr. Dave Hennen Morris, an old Harvard man, who married Miss Alice Shepard, a daughter of the late Elliot F. Shepard, has

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lately become deeply interested in automobiles. At every scheduled run of the Automobile Club he is always on hand, and he is becoming very expert in handling one of the machines.

Mr. Edwin Gould has taken up automobilism, although the sport has not appeared to appeal to his brothers, Mr. George J. Gould or Mr. Howard Gould. Mr. Gould has done considerable work, but prefers the country to the more crowded city streets.

In running over the list of our fashionable automobilists a host of other names readily suggest themselves, including Mr. Barber, Mr. J. C. McCoy, Mr. Jules Bache, Mr. William B. Coster, of the Calumet Club; Mr. Ernesto G. Fabbri, who married Miss Edith Shepard, and who lives at Scarborough; Mr. E. H. Harriman, of the Union Club; Mr. V. Everit Macy, of Scarborough; Mr. James Roosevelt Roosevelt, of the Knickerbocker Club, and Mr. Warner De La Montaigne Van Norden, son of Mr. Warner Van Norden.

While society people have largely affected the small runabouts and similar light carriages which are suitable for road work, they are also taking up the broughams and victorias, and use automobiles for more formal purposes. Several society women have been known to pay fashionable calls in their electric broughams, and the sight of a motor victoria on Fifth avenue is now becoming so common as to create little comment.



Two Automobile Road Races

Organized by the Automobile Club of America.

THE FIRST ROAD RACE

THE first road race of the Automobile Club of America took place March 31, 1900. The course was between the Waldorf-Astoria Hotel and the Casino, in Ardsley-on-Hudson, a distance of 26 miles.

Ten vehicles participated. The start was made at 10 A. M.

In compliance with the municipal regulation as to speed the carriages were paced to Central Bridge; from this point to the finish, the speed not being governed, the race began in earnest.

The course, after leaving Central Bridge, was by way of Sedgwick avenue, to Kingsbridge Station, to Broadway, to Getty Square, Yonkers, to Warburton avenue, to the Casino at Ardsley.

The results of the race are given in the following table, the previous record for the course being 1 hour and 55 minutes:

Finish.	NAME.	POWER USED.	HORSE POWER.	WEIGHT OF VEHICLE.	TIME.
					H. M.
1	S. T. Davis, Jr.	Steam ...	3	550 pounds	1.17
2	C. S. Weston and Frank Stillman	Gasoline .	9	1,600 "	1.25
3	D. W. Bishop, Jr.	"	6	1,500 "	1.27
4	G. F. Chamberlin	"	6	1,500 "	1.29
5	A. C. Bostwick and Leonce Blanchet	"	6	1,500 "	1.34
6	A. R. Shattuck and General G. M. Smith	"	6	1,500 "	1.45
7	D. H. Morris	Steam ...	3	550 "	1.50
8	J. C. McCoy	Gasoline .	6	1,500 "	2.13
9	G. I. Scott	Gasoline .	1 3/4	225 "	2.30
		Tricycle			
10	A. L. Riker and Jefferson Seligman	Gasoline .	6	1,500 "	2.35

Mr. Scott on his tricycle was in the lead on Warburton avenue, near Yonkers, when things went wrong and he had to push his machine afoot to the club-house.

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Mr. Léonce Blanchet, the Donor of the Cup

THE SECOND ROAD RACE

50 Miles in 2 hours 3 minutes and 30 seconds, for the Blanchet Cup

Over the finest stretch of turnpike in the neighborhood of the metropolis nine members of the Automobile Club of America competed for a cup presented by Mr. Léonce Blanchet, member of the Automobile Club of France.

A HANDSOME CUP

The cup, which was offered by him in recognition of the many courtesies tendered him by the Automobile Club of America, is a beautiful trophy, and was on exhibition for one week at the rooms of the club at the Waldorf-Astoria, where it was much admired. It is of silver and is of the loving-cup design, with two widespread handles. The inscription reads: "Presented to the Automobile Club of America by Léonce Blanchet. Fifty-mile Race, April 14, 1900." The name of the winner will, of course, be added.

Two Automobile Road Races



The Winner Towed to the Starting Line

THE COURSE

The course stretched from Springfield, three miles beyond Jamaica, to Babylon, a distance of twenty-five miles, passing on the way the villages of Lynbrook, Rockville Centre, Millburn, Freeport, Merrick, Bellmore and Amityville and return. There was no attempt at any point to interfere with the race, as was feared, the residents in the villages, the farmers and the local police doing excellent work in keeping the road clear.

The Merrick road, along which the "autos" raced, proved to be an ideal course for such a contest. The route was selected with great care by the Committee on Runs and Tours.

EXCITEMENT IN THE VILLAGE

The usually quiet village of Springfield has seldom, if ever, been the scene of so much excitement and activity as prevailed for hours before and during the progress of the contest. In addition to the automobiles competing, twenty others made the starting and finishing point their rendezvous for the day.

There was a big crowd of automobilists and other spectators present to see the start. The inhabitants of the neighboring country gathered in great numbers and made various comments, all more or less amusing, about the machines. This is the first

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The Timekeepers' Conveyance

big race ever held by the club, and in consequence it was of more than ordinary interest.

A clubman was stationed at every crossroad to warn approaching teams and cyclists when a fast moving "auto" was approaching. The Long Island Railroad crosses the course twice, and it was arranged to take out time if any "auto" became stalled by barred gates caused by the passage of a train.

Before the start Dr. E. C. Chamberlin and Capt. Homer W. Hedge went on ahead in their automobiles to act as timekeepers.

THE START

The start was at 10.24 o'clock. Only nine of the fifteen "autos" entered took part in the race. Mr. Whitney Lyon acted as starter, and Mr. V. Everit Macy held the watch. The automobiles were started under thirty seconds headway, the first man out being Mr. A. L. Riker in a specially built electric wagon, which was towed to the starting point to save his power for the race. Mr. Bostwick came next, Mr. Bishop third, Mr. Fischer fourth, Mr. Hall fifth, Mr. Field sixth, Mr. Chamberlin seventh, Mr. Morris eighth, and Mr. Davis last. The machines went away with remarkable precision. The Locomobile owned by Mr. S. T. Davis, Jr., was the favorite with the experts, and it

Two Automobile Road Races

was generally expected that he would win. In the run to Babylon, Mr. Davis slowly but surely overhauled those in front of him, except Mr. Riker.

The feature of the race, not calculated upon by the promoters, was furnished by Mr. C. H. Tangeman, a motor enthusiast of Brooklyn. Mounted on a noisy little gasoline tricycle, he left Springfield just as Mr. Riker was being started, and, keeping company with the latter on the outward journey, he raced away from him on the home stretch, arriving at Springfield nearly five minutes in advance of the actual winner.

Mr. Tangeman, of course, was not a competitor for the prize, nor was his machine eligible had he desired to compete. His



Mr. Alexander Fisher

presence, however, furnished both amusement and excitement all along the line.

THE OUTWARD TRIP

On the outward trip the racers had the wind behind them. The roads were in almost perfect condition and the air was fresh without being uncomfortably chilly. To the plaudits of the enthusiastic spectators Mr. Riker began the journey, with Mr. C. H. Tangeman on his fretful machine trailing him.

RACED WITH A TRICYCLE

Toward Valley Stream the ill-assorted vehicles raced together. Then the tricycle drew into the lead and made the pace to Free-

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Mr. D. Wolfe Bishop, Jr.

port. From this point to Seaford and Babylon the two alternated in the lead, the smaller machine being first to make the turn.



Mr. George F. Chamberlin

Two Automobile Road Races



Mr. A. L. Riker

Mr. Riker's time to that point was one hour and thirty-eight seconds, but less than two minutes later he was followed by Mr. S. T. Davis, Jr., who had been the last to leave Springfield. Mr. Davis' time to the turn was only fifty-eight minutes and fifteen seconds, and it looked as if he might prove the winner of the race.

THE RETURN TRIP

The turn at Babylon was made around two barrels placed in the centre of the road. There are crossroads at this point, but the automobile experts did not apparently need the extra room, for all of them made the turn around in the actual width of the Merrick road. The only accident at this point happened to the machine containing Messrs. Field and Skinner. The attempt was made to make the turn too quickly, and the result was that one of the pneumatic tires was twisted off the rim. The repairs were made at once and the machine finished.

In the beat back against the wind, however, the superiority of Mr. Riker's racing car was easily demonstrated, and he steadily gained over all his opponents, arriving back at Springfield at twenty-seven and a half minutes past twelve o'clock.

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Mr. C. J. Field

THE FINISH

He made the finish in good style, rushing down the hill into Springfield at the rate of twenty-five miles an hour.

Had the race been a much shorter one it is the opinion of the experts that the steam machines, which travel at a very high rate,



The Finish

Two Automobile Road Races

of speed for short stretches, would not have been defeated so easily. Had it been a much longer one it is the opinion of the veteran *chaffeurs* that the gasoline vehicles would have carried away the prize.

Had the race been one straight run of 50 miles, the results would probably have been different.



Mr. A. C. Bostwick and Mr. Léonce Blanchet

RESULTS OF THE RACE

Finish.	NAME.	KIND OF POWER.	HORSE-POWER.	WEIGHT OF VEHICLE.	TIME, 25 MILES.	TIME, 50 MILES.
1	A. L. Riker	Electricity	—	2,500	1.00.38	2.03.30
2	S. T. Davis, Jr.	Steam	3	550	0.58.15	2.18.27
3	A. Fischer	Gasoline	5	1,400	1.06.44	2.30.01
4	D. Wolte Bishop, Jr. .	"	6	1,550	1.13.10	2.37.52
5	A. C. Bostwick	"	6	1,500	1.17.03	2.46.40
6	G. F. Chamberlain	"	6	1,500	1.18.58	2.48.42
7	C. J. Field	"	3	700	1.24.00	3.15.30
8	D. H. Morris	Steam	3	550	1.01.45
9	W. H. Hall	"	3	550

The time made was not extraordinary, compared with French records, but was capital for a beginning in long distance racing. The event will always be looked back upon with interest as that of the first of its kind held in America.

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Mr. A. L. Riker, the Winner of the Fifty-mile Race

PRESENT RATING OF CHAUFFEURS

		FIRST RACE.	SECOND RACE.
		26 Miles.	50 Miles.
1	Davis.	1	2
2	Riker.	10	1
3	Bishop.	3	4
4	Fischer.	0	3
5	Weston.	2	0



Two Automobile Road Races

COMMENTS ON THE RACE.

While there is unanimity of feeling in the matter of Mr. Riker's personal victory, it cannot be said the race proved anything worthy of addition to the history of the automobile. In Mr. Riker's wheeled meteor is exploited a specially built racing machine competing with ordinary pleasure vehicles, costing from \$750 to \$1,000, weighing from 550 to 1,600 pounds, and averaging 4 or 5 horse-power.

Mr. Riker's racer weighs about 2,500 pounds, 1,200 pounds of which is invested in accumulators. The machine is equipped with two motors. The horse-power used therein is an unknown quantity. As to the cost of the vehicle it can only be surmised to be about 6 or 7 times the intrinsic value of the other vehicles entered in the race.

One fact was firmly established by this race, however, in the remarkable demonstration of the durability and staying power of Mr. Davis' steam carriage, an ordinary runabout with an ordinary boiler, beating the electric marvel from Springfield to Babylon, a distance of 25 miles, by 2 minutes. At the latter point Mr. Davis found it necessary to replenish his boiler, an operation covering a period of 7 minutes. As with their brethren of the railroad locomotive, 7 minutes to the modern sport-loving automobilist assumes the chronological proportion of as many centuries.

With the strong wind-pressure encountered on the home-stretch all the competitors were at a great disadvantage with the exception of Mr. Riker's racer, which experienced no difficulty in putting 15 minutes before Mr. Davis' 550-pound locomobile.

The fact that Mr. Riker's machine is compact in construction cannot be forgotten when consideration is given to the speed maintained in the head-wind during his return from Babylon to Springfield.

The machine carries 72 cells, divided into 3 compartments, each controlled by a lever. One compartment was employed in the outward trip, one during the return and the remaining compartment was called into use at the finish of the race.

Mr. Riker's machine is, indeed, a wonderfully constructed affair, reflecting great credit on its designer and engineer.

All the good points of masterly vehicle engineering, mechanical workmanship and electrical application have been brought into service in this unpretentious appearing, simple and compact vehicle.

Air and road resistances have been admirably calculated in

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Secretary Hedge and Mr. Whitney Lyon

its low setting, without neglecting consideration of strain in the construction of its delicate mechanism. Enthusiasts of the automobile cannot but compliment those who contributed to the construction of this racer and to entertain the hope that Mr. Riker has new surprises in store, whereof we will be apprised during the Paris Exposition.

While the arrangements for this long-distance race were admirably planned, the plans were but poorly executed.

It was noticed that, after selecting with exquisite choice the Merrick road for the scene of the contest, the majority of the members of the Committee on Runs and Tours absented themselves from the race. To this, the cause of the inadequate preparations at the starting point may be assigned.

The lack of experience displayed in the conduct of the race from the start to the finish, indeed, was marked. Many instances of this fact came into unpleasant view before and during the contest.

At 10 A. M., at which hour the race was scheduled to start, hurried explanations were furnished the contestants as to direction, railroad crossings, turning point, etc.

No preparation for the finish was made.

Two Automobile Road Races

The manner of distinguishing the identity of the contestants, also, was managed unsatisfactorily. Instead of having each vehicle bear its owner's number, the tagging was accomplished by the adjustment of a black leather shield, bearing the number in white, on the chest of the principal contestant, and held in place by a strap passed around the body.

As each rider endeavored to minimize the wind resistance, his crouching figure swallowed his identity in the hollows of his anatomy.

The white upright turning stake, which should have been placed in position in Babylon, remained laying on the road in Springfield.

At the last moment, when it seemed that the preliminaries were about to develop into chaos, Mr. Whitney Lyon obligingly undertook to bring about something resembling order, in which impromptu capacity he succeeded admirably.

In the selection of the point marking the finish absolutely no judgment was shown. In this matter the finishing point was, illogically, set down as the starting point.

Again Mr. Lyon, in his obliging foresight, placed another member of the club at the top of the hill overlooking the finish line, to signal the approach of the down-shooting machines.

To the wisdom of Mr. Lyon's precaution testimony is borne on what promised at the finish to be a most tragic incident.

Just as the automobile handled by Mr. Fischer was signalled a two-horse farm truck reached the hill, going toward Babylon. The approaching machine, which was coming along at a two-minute clip, frightened the horses, and their driver lost control of them. The animals whirled directly across the road. A cry of horror went up from the spectators, for it looked impossible for Mr. Fischer to pass between the frightened horses and the other automobile.

It was a moment when nerve and brain were required. Being unable to slacken speed, Mr. Fischer depended upon the suppleness of his wrist to avoid disaster. The automobile seemed to lurch just at the critical moment, and then it swept almost across the road, clearing the wagon. It was a remarkable piece of steering, and the spectators yelled in their delight and appreciation. In no other vehicle, under the same conditions, could Mr. Fischer have avoided a smashup.

A real revelation was his gasoline auto—which can be considered among the best make of gasoline carriages in America.

The skillful driving, under most adverse conditions, of Mr. Bishop attracted favorable comment in all quarters. His per-

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formance during the race stamped him as one of the best *chauffeurs* in the country.

The race, in brief, was an uneven contest between steam, gasoline and electricity—a contest in which ordinary steam and gasoline carriages were pitted against an electric comet on wheels, built to compete, in Paris, for the kilometre ($\frac{5}{8}$ of a mile) record.

The decided sentiment against road-racing that prevails in the Automobile Club of America—with which public sentiment is also strongly in accord—makes it imperative for the fostering of our new national industry to provide for automobile racing within enclosed spaces. In this manner the electric, steam and gasoline forms of motive power will be given equal opportunity to exhibit their qualities to the public eager for acquaintance with the new form of locomotion.

Road-racing is sowing terror and death on the highways of France; such a state of things would not be tolerated in this country, and if it were, it would certainly injure the industry at the start and greatly retard its development.

It is therefore proposed to organize the Automobile Racing Association of America.

A large number of members of the Automobile Club of America have expressed their willingness to join in the movement for the proposed organization.

Until such an organization is perfected we will probably witness some more of these criticism-inviting road races.

AMERICAN AUTOMOBILES IN THE PHILIPPINES.

The signal corps of the United States Army has recently been supplied with electric automobile wagons for use in the Philippines. These wagons are of two kinds, one to carry the instruments and material and the other to carry the personnel. The first is built like a covered ambulance, with rubber-tired wheels, and contains a storage battery capable of running the vehicle for 30 hours on one charge when carrying 1,500 pounds of load. There are two $3\frac{1}{2}$ horse-power motors, one in each rear wheel. The maximum speed is about 10 miles an hour. The other wagon is constructed like a high cart and is in other respects similar to the first. Both wagons are fitted with electric side lights, and the first also has electric lights in the interior. Other military applications of the automobile have been considered by the military world, but this is the first actual introduction.

The French Voiturette Cup

THE contest for the cup offered by our French contemporary, *Le Journal des Sports*, has proven that the voiturette is by no means the frail contrivance supposed by many unfamiliar with its construction. The race over the Saint-Germain-Rouen course, a distance of 218 kilometres (135.38 miles) was a fairly good test of the endurance of the light road carriage. Vehicles of all kinds were entered—some with water-jackets,



Starting of Class A and C at Chambourcy

some with flanged cylinders, some with electric igniters, some with ignition-tubes. Certain carriages went over the course with a speed and regularity of motion, truly remarkable. The greater number of voiturettes finished without accident, a result which is noteworthy when it is considered that in automobile races safety is thrown to the winds for the sake of running at the very highest possible speed. Not merely to finish, but to finish first is the aim of every racing *chauffeur*.

It is true that a race over a course of 218 kilometres, even when that course is well-sprinkled with hills such as those of

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Rolleboise, Gaillon, Anthieux, and Fleury, may not be a sufficient test of the voiturette's capability of withstanding great strains; but it certainly proves that considerable improvement has been made in the building of road carriages, especially when it is considered that in former races voiturettes often enough miserably failed in comparison with heavier vehicles.

The larger voiturettes, as every one expected, won the race. Weight and power told. It was noticeable that the carriages with water-jacketed motors seemed to outclass the vehicles with flanged motor-cylinders. But the flange-cooled motors were far from being beaten. Their lightness and simplicity proved of service to them and enabled them to achieve truly remarkable results. Of the carriages entered in the class comprising vehicles weighing less than 250 kilos (550 lbs.), the winner made a very good showing. The winner in the class of vehicles weighing over 250 kilos was M. Lefebvre, whose vehicle was a Darracq carriage.



Finish of the winner on the road of Loges in St. Germain

Coxey's Lieutenant on Good Roads

THE newspapers of Kansas City printed under date of April 6 are replete with accounts of the open-air meeting conducted in that city on the night of April 5 by Carl Browne, of Coxey's Army fame. Coxey's famous lieutenant, it appears, has revived his commendable idea relative to the popular construction of good roads throughout the country. At the meeting the following resolutions were adopted:

Whereas, On last Monday evening a meeting was held in New York City of the Automobile Club of America, at which time a movement was inaugurated to agitate for the purpose of petitioning Congress for the construction of a great national road from the Atlantic to the Pacific, with connecting lines from all parts of the country North and South; and

Whereas, Such an enterprise being not only indicative of the great progressive spirit of the American people, will, if carried out, be a source of employment for thousands of people at good wages; therefore be it

Resolved, By this mass meeting of citizens of Kansas City, that we heartily indorse the proposed work and will do all in our power to petition Congress to aid the same.

The substance of these resolutions, it will be remembered, were adopted at the dinner tendered recently at the Waldorf-Astoria by the Automobile Club of America to Major-General Miles and the members of the Commission who have consented to make a preliminary report looking to the construction of a national highway from the Atlantic to the Pacific.

From Lieutenant Browne the Automobile Club of America have recently received the interesting communication which follows:

" 507 EAST 18TH ST.,
KANSAS CITY, MO., April 6th, 1900. }

Automobile Club of America:

GENTLEMEN—Reading in the *K. C. Journal* a dispatch that you were about to begin agitation for a great National highway, it naturally attracted my attention, for ever since I led the march to Washington, D. C., in 1894 to petition Congress to build a great National road to put the millions of *then idle men* to work,

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I have been traveling, speaking and advocating the same thing in a desultory sort of a way, for there was no central idea or plan to work on, and I hailed your action with delight. So last evening I called an open air meeting here which was largely attended, read your resolutions and proposed work as published in the papers here and after talking awhile submitted the preamble and resolution enclosed as published in the *K. C. Journal*, and they were unanimously adopted. I am satisfied that the proposition will go with a whirl if pushed by your club, and the L. A. W. as it should and could be so that action could be had by the meeting of the next Congress.

I write this to submit a proposition to you on the line of the agitation of the subject.

If your club will fit me out with an automobile, I will, accompanied by my wife (Gen. Coxey's daughter, who rode the white horse as the Goddess of Peace on the historical first day of May, 1894, in Washington, D. C.), start from New York City for a trip to San Francisco over the proposed route of the National road, making speeches for it and having it endorsed by resolutions and otherwise, and putting machinery in motion for obtaining signatures for a monster petition to Congress. The experience I have had in this kind of work leads me to believe that I can be of great service in this great undertaking of yours, besides both myself and wife being national characters to considerable extent among the working classes at least, we would naturally draw out great crowds to see and hear, as do whenever I go to hold a meeting as witnessed here last night. I will ask no remuneration for our services further than the automobile and transportation for us from here to New York City, for myself and wife.

Should your club decide to accept this proposition it will be necessary for you to wire me here by Monday evening next, if possible, and not later than Tuesday noon, the simple word "*all right*," then I will immediately begin to prepare to start on receipt of your letter containing transportation.

The necessity for this haste is the reason that I will embark Tuesday in another enterprise awaiting reply from me, but since this opportunity presents itself I prefer this, if possible, for it has become almost second nature to me to advocate great National roads and public improvements—I am an enthusiast on the idea.

Hoping to hear favorable to this proposition, I remain,

Yours truly,

CARL BROWNE."



YOU will have to turn expressman and deliver Doctor Wallace's phaeton, Reggie," said the portly president of the Syndicate Automobile Company to his private secretary, "he wishes to take his first lesson this afternoon, but the instructors are all busy. He lives," consulting a memorandum, "at Swell Ridge, New Jersey. You ought to make it with the phaeton in two hours."

And thus it came that Private Secretary Reginald Van Valen, attired in a rather large pattern of tweeds and a deer-stalker, and smoking a "bull dog" pipe, went skimming over the Jersey meadows on a certain bright June day, to give a lesson in "driving" to a rich old doctor; a thing he was well qualified to do, having worked in the Syndicate shops before he became secretary.

Doctor Wallace was out when he arrived at his destination—a sudden call—but had left word of his early return; so, loading his pipe afresh, and making himself comfortable in the roomy phaeton, he settled down to await the doctor's coming.

"Excuse me, is this Doctor Wallace's new automobile?" The voice at his elbow was a trifle imperative, but the owner thereof, a young lady in a dainty summer gown, was good to look upon.

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"Yes, Miss," answered the startled secretary, secreting his pipe and pulling himself together.

"That's right, sit up and look more business-like. You are the groom or what-d'ye-call-him that runs it, I presume; I am Doctor Wallace's niece, Miss French—move over, please, I am going to get in—now, John—I will call you John, being used to that name—take me for a ride!"

Whew! All that in one breath. And she took him for a servant. Here was richness; he would follow it up. "Certainly, Miss," he said meekly, starting the carriage forward, "at your service, Miss."

"Now," said the young lady when they were out of town, "tell me all about the way things work; I am going to surprise Uncle Dick by learning how to run his horseless carriage."

"Yes, Miss," replied "John," with twinkling eyes, "it's quite easy, Miss; to begin with, you push this here handle"—and he launched into a description of the mechanism of the phaeton, rendered into "Stable English."

"Really," said Miss French approvingly, when he had finished, "you seem to be quite posted, John, please to change seats with me and I will try my hand at running it."

"Yes, Miss, you will excuse me, Miss, if I hold the handles with you while you are practising."

"Of course," was the surprised reply, "I expect you to, John," and for the next half-hour the few people whom they met along the road were startled at the vagaries of the handsome automobile thus doubly maneuvered.

"There, Miss, now I think you have the knack, try it alone for a bit," said the artful "John," watching with pleasure the animation displayed in the girl's sparkling eyes and ruddy cheeks.

Miss French felt that she was having "the time of her life." Bowling over the smooth roads in the June sunshine, in this wonderful machine, which obeyed her every touch, her spirits rose to the boiling point. She ached to pour out her delight to some one. If only John, who, she noticed, was quite a nice-looking fellow, in spite of his loud clothes—if he was a gentleman—somebody she could talk to freely; but John, with his eternal "Yes, Miss," was only a servant; and her active tongue rebelled at the imposed silence.

A warning rattle told the observant "John" that something had gone wrong, and coming to a country blacksmith shop, he requested Miss French to stop before it, while he made an examination. An important nut was missing and he stepped within the sooty shop to procure a makeshift.

A Chance Acquaintance

To the mischievous girl, burning to drive the fascinating vehicle without a monitor, here was a heaven-sent opportunity. A push on the starting lever, and the automobile was moving swiftly down the road. Looking behind her, she saw the groom emerge from the shop and run after, shouting and waving his hands. An absurd couplet, learned in her childhood, flashed into her mind:

"Good-bye, John,
Don't stay long!"

she carolled, increasing the speed, and "John" was left behind.

At the end of a mile, sober second thoughts prevailed, and the madcap was ready to return. She moved the stopping lever, but, like the celebrated steam-leg of Mynheer Van Dam:

"It had started to go,
And it wouldn't stop!"

a bolt, from which the nut had unscrewed, had dropped out, disconnecting the lever. The phaeton was running away!

Frantically Miss French worked with the useless lever, and as the realization of her predicament came to her, she felt suddenly weak. An innocent cow, standing squarely across the road just ahead, precipitated the inevitable. Dropping the steering lever, the girl covered her face with her hands, while the runaway, left to its own devices, proceeded to dodge the cow and make straight for the roadside fence—a sounding crash, and with spinning wheels it toppled over into the ditch.

A moment later, and a hysterical young lady, her gown ruined and her hair in disorder, crawled into sight from beneath the smashed top, and sitting on the grassy bank, regarded the ruin she had made, with misty eyes.

It was thus that "John," capless and out of breath, found her. To his panting questions as to her injuries, she replied in accents suspiciously tearful; then suddenly laughed loud and long, as the humor of the situation struck her.

The example was contagious and the "groom," immensely relieved to find no harm done to the fair cause of the mischief, joined in unrebuked.

An approaching carriage had a sobering effect. The horse showed signs of bolting at the sight of the overturned vehicle, and "John" promptly seized its bridle, while Miss French, recognizing the driver, who was regarding the scene in mute amazement, called out gleefully:

"Oh, Mrs. Broome, such an adventure as I have had; this is Uncle Dick's new automobile—what there is left of it, and the

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groom that runs it; I stole them and was run away with and just had a thrilling upset; isn't it ridiculous!"

"A little slower, Kitty," laughed Mrs. Broome, "did you say the—er—groom ran away and upset you?" exchanging a merry look with the "groom."

"Certainly—what are you laughing about?" said the girl, uncomfortable at the continued smiles on the faces about her; "John, you are insolent; I shall report you to Doctor Wallace"——

"Oh, dear, here is a mystery," said Mrs. Broome, "Reggie, you rascal, what do you mean by this masquerading?"

"Reggie?" echoed the girl, an inkling of the truth penetrating her mind.

"Certainly; Reginald Cuyler Van Valen, according to his sponsors in baptism, of which I have the doubtful honor to be one. Pray, what has he been calling himself; you, sir, explain!" to Reggie.

"I—I—she"—began the guilty Reggie.

"Mrs. Broome, will you please to take me home," interrupted the girl, her cheeks aflame; "as for you, Mister Van Valen, a gentleman"—with stinging emphasis—"would not have allowed me to make the mistake, uncorrected, of taking him for a—servant!" And with this shot below the water line, the carriage drove off, leaving the abashed young man to take care of the wrecked phaeton as best he might.

It was a decidedly cool young lady whom Mr. Van Valen—quite by chance—met a fortnight later in the parlors of the Swell Ridge hotel, where Mrs. Broome was stopping, and it was only by dint of abject apologies that he secured forgiveness on condition that he never again allude to the mortifying affair.

Between these two the acquaintance so singularly begun now prospered merrily, and it was not many moons before it ripened into something closer. Secretary Reggie's automobile trap became a familiar sight in Swell Ridge, and many were the rides indulged in by the pair through the long summer that followed, protected by a "sure-enough" groom, perched behind.

The occasion of the Van Valen-French wedding, which occurred on a brilliant October day, brought together the largest concourse of automobile vehicles ever seen in Swell Ridge.

After the reception, an "auto" brougham took the happy couple to the depot, and the radiant bride, nestling close to her husband, whispered mischievously in his ear:

"You ought to bless that phaeton—'John.'" To which he replied with fervor:

"Yes, Miss—I mean Missus; I do!"

The Coming International Automobile Congress

THE international congress of the automobile sports and industries will hold its meetings in Paris, from the ninth to the sixteenth of July. The following rules have been adopted, by which the members are to be governed:

Article 2.—The International Automobile Congress shall be opened on July 9, 1900, in the great hall of the Palais des Congrès.

Subsequent meetings, conferences, and other reunions shall be held in the club-house of the Automobile Club de France, 6 Place de la Concorde. The congress shall last for one week.

Article 3.—Those persons only shall be considered members of the Congress who shall have applied to the Secretary of the Committee of Organization before the opening of its session, or who shall have inscribed their names during that session, and who shall have paid the assessment agreed upon.

The assessment of each member shall be 20 francs.

The title of donating member (*membre donateur*) can be secured by the payment of an assessment not less than 100 francs.

Article 4.—The members of the Congress shall receive membership-cards to be sent to them by the Committee of Organization. These cards are strictly personal.

These cards do not entitle the holder to enter the grounds of the Exposition gratuitously; they give him the right to enter the club-house of the Automobile Club de France and to take part in all the meetings which will be held there during the Congress.

Article 7.—The Congress shall comprise:

Public meetings;

General meetings;

Sectional meetings;

Conferences;

Visits to industrial establishments, witnessing of tests, promenades, etc.

Article 10.—No paper shall be read at a meeting nor be made the subject of discussion, if the author has not submitted a résumé thereof, or the conclusions he has reached, to the Committee of Organization before May 1, 1900.

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Article 14.—A summary of the proceedings shall be printed and distributed among the members, as soon as possible, after the close of the session.

Article 15.—A detailed report of the work of the Congress shall be published by the Committee of Organization. The Committee reserves the right of fixing the length of papers or communications submitted for publication.

This report shall be sent gratuitously to the members of the Congress.

PROGRAMME OF THE CONGRESS

I.—Historical Questions.

History of automobile locomotion in Various Countries—
Author, Count de Chasseloup-Laubat.

II.—Technical Questions.

A.—Motors.

STEAM-ENGINES.—Author, René Varennes.

Steam-Generators.—General introduction—Degree of vaporization and weight of the generator—Water vaporized per unit of fuel—Solid and liquid fuel—Feeding devices—Superheating.

Engines.—General considerations—Fixed or variable expansion—Compound Engines—Direct admission to large cylinder in starting—Efficiency—Weight of the engine per horse-power at normal speed—Lubrication—Aero-condensers—Oil separators—Devices for rendering the exhaust invisible.

EXPLOSION-ENGINES.—Author, G. Forestier. General considerations—Carburation—Ignition—Cooling, Pumps, Radiators—Regulation—Starting—Lubrication—Exhaust-muffles—Efficiency—Weight of the motor per horse-power, fly-wheel included—Effect of Compression—Devices for varying the power of the motor.

PROGRESSIVE COMBUSTION MOTORS.—Author, M. Banki. Efficiency—Weight per horse-power, etc.

ELECTRIC MOTORS.—Author, E. Hospitalier.

Accumulators.—Total weight per kilowatt hour at the terminals for different rates of discharge—Rates of charging and discharging—Efficiency at normal rate of charging and discharging—Life of battery expressed in number of charges, either for the entire accumulator or for the positive plates.

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Motors.—General considerations—Type of Armature
Excitation—Brushes—Normal Speed—Weight per horse-
power—Efficiency.

Switches.—General considerations—Starting—Vary-
ing the speed of the motor. Electric Braking—Recupera-
tion—Instruments of measurement, control, and safety—
Use of trolley on the road.

MISCELLANEOUS MOTORS.—Author, M. Barbet.

Compressed or Liquefied Gas Motors.—Miscellaneous Motors
—Efficiency—Weight per horse-power, etc.

B.—Transmission.

Author, M. Gaillardet.

Clutches—Speed-changing gears—Reversing-gears—Gearing
—Belts and Pulleys—Friction-gears—Other Systems of Power-
Transmission—Differentials and their substitutes—Connection
of the driving wheels with the last member of the transmission-
gear (chains, divided axles, etc.)—Devices for protecting and
lubricating the transmission gear—Bearings, use of balls and
rollers, anti-friction Metals—Special devices designed to coun-
teract the effect of the elasticity of the frame on the transmission-
gear (divided shafts, elastic couplings, etc.).

C.—Carriage Frames and their Appurtenances.

FRAME AND SUSPENSION.—Author, M. Jeantaud.

Frame.—Wooden and iron frames—Frames of special
construction—Tubular frames.

Suspension, Springs.—Complete suspension of wagon
body and motor—Suspension of the body only, the motor
not being suspended or only partially suspended.

WHEELS, AXLES, TIRES.—Authors, Captain Ferrus and A.
Michelin.

Wooden wheels.—Wooden wheels with metal hubs—Wheels
with wooden hubs, wooden spokes, and metal rims—All-metal
wheels with direct or tangent spokes—Disk-wheels—Hubs and
spindles—Ball and Roller Bearings—Metal Tires—Elastic Tires
(solid or hollow rubber).

Pneumatic Tires.—Protection of elastic or pneumatic tires—
Elastic wheels of various types—Slipping and sliding of the
wheels and the prevention thereof.

BRAKES.—Author, M. Bochet.

Brakes controlling some part of the transmission gear.—
Brakes acting directly on the wheels—Brakes acting directly on
the ground—Brakes acting in front and in the rear—Prevention
of the Recoil—Motors as brakes.

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STEERING.—Author, Carlo Bourlet.

Steering.—King Bolts—Pivots—Diagrams showing the correct method. Theoretical solutions and solutions approximately corresponding with practice.—Various systems of pivots—Use of balls—Irreversible steering-gears—Advantages accruing from a large steering angle—Diameter of the smallest circle in which a vehicle can turn—Differences between the tracks of vehicles in which the front wheels are the steering-wheels and in which the rear wheels are the steering-wheels. Advantages and disadvantages of the two systems.

Driving and Steering Wheels.—Various systems of transmission solving the problem.

DETAILS OF CONSTRUCTION.—Author, A. Bollée.

Prevention of breaks in the pipes and tubes of automobiles.—Different systems of joints—Means of preventing the unscrewing of nuts—Use of aluminium and its alloys.

D.—The Carriage-Body. Author, M. Jeantaud.

New forms of bodies.—Lightness—Use of aluminium—Interchangeable bodies adapted for the same frame.

E.—Tractive Force.

TRACTION.—Author, G. Forestier.

Coefficients of rolling-friction on roads.—General efficiency of the transmission-gears of automobiles, from the motor to the rim of the driving-wheel—Effect of Suspension—Effect of the Tires—Effect of the resistance of the air—Forms best adapted to reduce this last effect.

POWER TO BE GIVEN TO AUTOMOBILES.—Author, M. Hirsch.

Tendency to increase the power.—Difference in the action of mechanical and animal motive power; great momentary elasticity of the latter—Difference in behavior of driving and non-driving wheels—Reports of experiments pertaining to this question.

III.—Economic Questions.

Authors, Pierre Giffard and Lucien Pénssé.

Comparison of vehicles driven by motors of different types (steam, petroleum, electricity, etc.).—From the standpoint of the weight of the motor and its fuel supply—From the standpoint of ease of control, comfort, cleanliness, etc.—Reports of experiments, tests, and contests, giving the cost of transporting persons and merchandise, and the conclusions to be drawn therefrom.

Importance and cost of repairs.—Cost of keeping the wheels and tires in condition (iron, elastic, or pneumatic). Life and cost of maintaining accumulators.

Coming International Automobile Congress

Report of the work of the Automobile Club de France.—
Various Contests—Races.

IV.—International Questions. Authors, Ballif and Sauvage.

Unification of the international formalities to be observed in traveling from one country to another.—Standardizing of gages and bolts—Standardizing of charging terminals of electric carriages—Standardizing of accumulator cells.

The Gordon Bennett Cup

June 14

THE itinerary of the Bennett Cup race between Paris and Lyons has finally been arranged as follows:

Suresnes, Saint-Cloud, Ville-d'Avray, *Versailles*, Buc, Tournus, Châteaufort, Saint-Rémy-les-Chevreuse, Les Molières, Station de Limours, Angervilliers, Saint-Cyr-sous-Dourdan, Dourdan, Les Granges-le-Roi, La Forêt-le-Roi, *Etampes*, Sermaises, Intville-la-Guétard.

Pithiviers, Dadonville, Boynes, Barville, Beaune-la-Rolande, Maizières, Ladon, Saint-Maurice-sous-Fossard, *Montargis*, Mormant, Nogent-sur-Vernisson, La Bussière, *Briare*, Bonny-sur-Loire.

Neuvy-sur-Loire, La Celle-sur-Loire, Myonves, *Cosne*, Pouilly-sur-Loire, Mesves-sur-Loire, *La Charité*, La Marche, Pougues, *Nevers*, Saint-Pierre-le-Moutier.

Villeneuve, *Moulins*, Toulon, Bessay, Saint-Loup, Varennes-sur-Allier, Perrigny, *La Palisse*, Saint-Prix.

Saint-Martin-d'Estreaux, La Pacaudière, Changy, Saint-Forgeux-l'Espinasse, *Roanne*, Le Coteau, Neaux, Saint-Symphorien-de-Lay, Nachézal.

Tarare, Pontcharra-sur-Turdyne, Bully, *L'Arbresle*, La Tour-de-Salvagny, Tassin, LYONS.



Diary of the Forthcoming European Automobile Events

PUBLISHED FOR THE BENEFIT OF AMERICAN TOURISTS

THE AUTOMOBILE CLUB OF GREAT BRITAIN AND IRELAND

- April 24 to May 11. . . The 1,000 miles Motor Vehicle Trial,
London to Edinburgh and back, in-
cluding one-day exhibitions at nine
Provincial Cities.
- May Heavy Trials.
- May Three Days' Trials of Electrical Vehicles.
- May 14-19. Exhibition of Motor Vehicles competing
in the Trials, Prince's Skating Club.
- May 31 to June 5. . . Whitsuntide Tour.
- June Tests of Horse-Power of Motor Vehicles.
- June 30. Motor Cycle Race Meeting (Crystal Pal-
ace).
- July Quarterly 100-mile Trials and Hill-Climb-
ing Trials.
- July The Club's Race in France for Racing
Carriages, Tourist Carriages, Voitu-
rettes and Motor Cycles.
- July 14. Gymkhana at Sheen House Club.
- September Autumn Tour.
- October Quarterly 100-mile Trials and Hill-Climb-
ing Trials.

CONTINENTAL EUROPE

- May 10. *Etampes-Chartres (100 kiloms.). Voi-
turettes (*Le Velo*); second year.
- May 17. *Chartres-Etampes (100 kiloms.). Moto-
cyclettes (*Le Velo*); second year.
- May 23. *Paris-Bordeaux (568 kiloms.). Moto-
cycles and carriages (*Le Velo*); third
year.
- May or June. Munich-Vienna (Austrian and Bavarian
Automobile Clubs).

* Indicates held under the rules of the Automobile Club of France.

Diary of European Automobile Events

- May to October *PARIS INTERNATIONAL EXHIBITION.—
Great Display of Automotor Vehicles
and Allied Trades (under the man-
agement of the Automobile Club de
France). Automobile Fêtes every
Thursday. May 14, 15, 16, 18, 19—
Tourist Vehicle Races. June 18, 19,
20, 22, 23—Cab Trials. July 23, 24,
25, 27, 28—Speed Races (*l'Éventail*).
August 13, 14, 15, 17, 18—Voiturette
Competitions. September 17, 18, 19,
21, 22—Light Delivery Van Compe-
titions (*Poids Légers*). October 8, 9,
10, 12, 13—Heavy Vehicle Trials
(*Poids Lourds*). Grand Motor Ve-
hicle Procession to the Automobile
Club of France Club House.
- June 3 *Etampes-Chartres (100 kiloms.). Moto-
cycles (*Le Velo*); fourth year.
- June 3 and 4 Bordeaux-Perigueux-Bordeaux (Auto-
mobile Club Bordelais).
- June 10 Paris-Reims.
- June 14 *Gordon Bennett Cup Race (Paris to Ly-
ons); 560 kiloms.
- June 24 Helenenthal-Siegenfeld (Baden) Hill-
Climbing Trials.
- June 24 Brest-Rennes-Brest (500 kiloms.).
- July 1 Critérium de Provence (A. C. Salon).
- July 5-7 *Paris-Brest-Paris (1,200 kiloms.) (*Le
Matin*).
- July 9-14 International Congress on Automobilmism.
- July 13 Salon-Arles-Salon (*Critérium de Prov-
ence*).
- July 29 Paris-Dieppe (Motor Cycles).
- July 29 to August 5 Baden (Vienna) Motor Races, Gym-
khana, etc.
- Aug. 26 to Sept. 1 Spa Races and Meeting (Automobile
Club de Belgique).
- September 1-2 *Paris-Ostend (333 kiloms.) (*Le Velo*).
- September 9 Baden (Vienna) Road Race (60 kiloms.).
- October 19-23 Leipzig Motor Exhibition (five days).
- October 28 Hill-Climbing Contest (*La France Auto-
mobile*); third year.

* Indicates held under the rules of the Automobile Club of France.

A Map of the Electric Stations of France

THE Touring Club of France is occupied in the preparation of a map of France upon which will be indicated all the electric stations capable of furnishing "accumobiles" with the energy necessary for their resupply.

This map, drawn up under the direction of M. Le Doyen, honorary member of the council of administration, will be in outline, with the rivers picked out in blue and the railways in black (always a useful precaution). Only such localities as possess an electric station will be noted. Such localities will be connected with each other by straight lines, above which will be indicated the distances in kilometres. The lines will be in three colors. It is of importance, in fact, that the carriage electrician shall know the difficulties of the road that he is to enter upon, since the consumption of the energy stored up in his accumulators is in direct ratio of the obstacles to be surmounted. The colors will be red for even roads with level or slightly undulating stretches, yellow for moderately broken roads, and green for very hard roads.

The electric stations will be figured by special signs, indicating:

- (1). Stations for charging ignition accumulators;
- (2). Stations for charging carriage accumulators and installed for immediate operation;
- (3). Stations that have at their disposal a sufficient or more than sufficient force in continuous current, but not as yet provided with the apparatus (rheostats, etc.) necessary for its utilization;
- (4). Sources of alternating electric currents.

In order to make a success of this work, the club has addressed a circular to all lighting companies, engineers, manufacturers and *chauffeurs* who employ considerable electric force, and invites them therein to request of it a table of uniform charges, a copy of which it promises to put into their hands.

A preliminary tentative had already been made by the Touring Club, in its Annual (Section on Automobiles). With the aid that it is certain to meet with, it will once more have fulfilled its role by favoring the development of the new mode of locomotion and by removing the material difficulties that oppose themselves to the practical side of touring in the electric carriage.



The New Home of the Deutsche Automobil-Klub

The Deutsche Automobil-Klub

OUR illustration shows the new quarters of the Deutsche Automobil-Klub, as seen from the Zoological Garden, and therefore as it would appear to a person standing in a direction south of the Reichstag Building.

In its exterior the house at present offers little that is worthy of remark. The direction of the adorning hand that is to be laid upon it will occur at a later period.

After passing through the main entrance we find ourselves standing upon a spacious floor. To the right are arranged the rooms that are to be used by the club as offices, while those to the left, after the completion of their internal decoration, will be

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leased to a person who will conduct therein an up-to-date restaurant.

A very easy stairway invites the visitor to take the trouble to ascend to the upper story, in which are located the meeting and amusement halls. Industrious hands, busy with these at present, are endeavoring to place them in a state worthy of the club. Herr Stobwasser has been good enough to superintend the arrangements. As the second story is not needed by the club, it has been rented to private individuals. The ascent to this is made from Dorotheen street, on which opens a large door, from which also access may be had to the club's carriage-houses, which are grouped in an interior court within easy and convenient reach of the automobiles. Upon the ground floor are located the apartments of the janitor of the building.

The energetic President of the German Automobile Club, whose portrait we present herewith, was born on the 6th of September, 1847. He is the eldest son of His Serene Highness, the late Duke Victor Moritz Karl Franz von Ratibor and the Duchess Amalie, *née* Princess von Fürstenberg, who was born at Rauden, and died there on the 17th of January, 1899.



Duke Victor Amadeus von Ratibor, President of the Deutsche Automobil-Klub

Duke Victor von Ratibor studied at Bonn and Göttingen and took a Doctor's degree. In the year 1869 His Highness entered the regiment of Hussar Guards as Second Lieutenant, and took part therewith in the campaign against France. On June 19, 1877, while the Duke was attached to the German Embassy in Vienna, he married Countess Marie Breunner-Enkevoirth, the eldest daughter of August Johann Breunner-Enkevoirth, Count of the Empire. From this union sprang Hereditary Prince Victor, Prince Hans and two princesses--Agathe and Margarete. The princes indulged with ardor in the sport of cycling, the practice of which was favored by the beautiful parkway in idyllic Rauden, the

The Deutsche Automobil-Klub

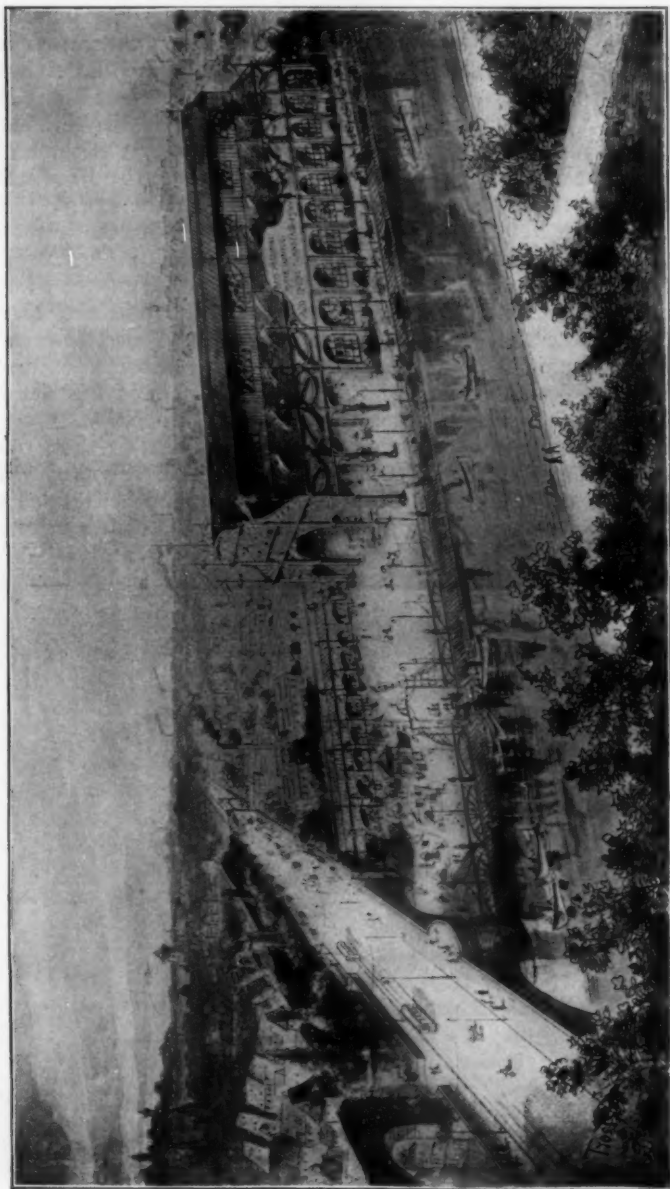
dwelling place of the ducal family. Soon after his marriage the Duke resigned his position in the army and thenceforward made his residence at Rauden, in order to familiarize himself with the administration of the property. After the death of his father in 1893 the Duke entered the Fideikommiss. His Highness is a hereditary member of the Upper House and a knight of the highest rank. Since 1897 he has been President of the Provincial Diet of Silesia, and, since 1898, a Colonel in the army. The Duke takes a very deep interest in sporting matters. Among other things he is President of the German Hunting Club, a prominent member of the Silesian Provincial Committee of the German Navy Club and of the Society for River and Canal Navigation. After the example of his father, who was always a patron of racing affairs, the Duke accepted the protectorate of the Upper Silesian Cycle-Racing Society and also of District 37 (Upper Silesia) of the German Automobile Association.

In the German Automobile Club His Highness presides over an association of sporting people which is capable of coping with the greatest of foreign clubs in every relation, and is destined to make the German name highly respected in automobile circles.



Insignia of the German Automobile Club

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Universal Automobile Exposition, Nuremberg, June 1st-July 1st, 1900

Universal Automobile Exposition at Nuremberg

A UNIVERSAL Automobile Exposition will be opened at Nuremberg on the first of June and be continued until July first. A splendid site having been selected, all the arrangements having been completed, and funds to the full amount required having been secured, work on the exhibition building and grounds was at once begun and is now being actively pushed.

The building, which is illustrated herewith, will occupy a superficial area of 21,520 square feet. From the grounds, which, when laid out, will offer numerous attractions, will radiate several lines of tramways provided with both open and closed cars that will carry the visitor to the most interesting parts of the city.

The exhibition will take place at a most auspicious season, when European travel is most active. At this period falls the season of Pentecost, with its accompanying holidays, and during the progress of the exhibition will be held the Bavarian Music Festival, which, it is calculated, will last eight days.

A considerable reduction in the freight tariff upon products designed for the exhibition has been secured, while the charges for wall and floor space, and for the use of the solid carriageway by automobiles have been placed at a very reasonable figure.

The fact that the various committees are composed of men who have had a wide experience in matters pertaining to exhibitions guarantees the one under consideration a successful outcome.

The Exposition site is located upon a spot already known from Richard Wagner's "Meistersingern," that is to say, upon the shore of the Pegnitz, directly at the place where the river leaves the flowery meadow to make its entrance into the interesting old inner town, through two separate branches, after passing under stately bridge-arches and between masonry walls, which, in olden times, were often placed by it deep under water as it crossed the city moats.

Upon the whole, the site is one of the finest that could be imagined.



In Tow

The New Sport Abroad

(By Our Own Correspondent)

TO begin far away: It is extraordinarily interesting to see what a field the automobile has already occupied in our vast African empire, and on the other hand what an impetus to the development of the French Soudan the automobile is giving. Thanks to the automobile a splendid connection between the Senegal and the Niger has been established and a regular motor-carriage postal service has been established between Kayes and Bamanko, the latter town being on the Niger. The dry nature of the Soudan country is well adapted to automobile requirements, and our authorities have been constructing admirable roads there with the customary French thoroughness, born of long experience in that respect. M. Chaudié, the Governor-General of l'Afrique Occidentale, lately arrived in the valley of the Niger to organize the new civil and military jurisdictions consequent upon recent readjustments, and likewise to inaugurate the new and important transportation service for passengers and merchandise by means of automobile voitures and wagons. On January 22 the Governor-General left Kati, a little town situated several kilometers from Bamanko, and on the 24th arrived at Kita, 180 kilometers away, making the distance in two stages of six hours each—an average of 15 kilometers an hour. From Kita he continued by automobile to Toukouto, the present terminus of the railway from Kayes, arriving there on the 27th, and there taking the train. Five days were sufficient to take the Governor-General from the Niger to Kayes, a journey that by the ordinary means of locomotion has heretofore occupied thirteen to fourteen days. At Kita the Governor-General gave a dinner to the various functionaries, army officers and notables there. Reviewing the various elements that were contributing to the value of our great Soudanese possessions the Governor-General, in his speech, paid special attention to the factor of motor-traction, and felicitated warmly the promoter of the automobile in Africa, M. Felix Dubois, on the success of his work. He also paid a deserved tribute to Captain Palabre, the constructor of the route. On his return to Kayes M. Chaudié expressed to the European colony there his great satisfaction with the new mode of transportation which had taken him so comfortably on a journey that on his previous visit had occupied thirteen days.

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The value of the automobile for military purposes was the subject of some notable remarks by the Minister of War, General de Gallifet, before the Chamber the other day. He said that particular attention had been given to the problems connected therewith by some of the ablest officers in the army, and excellent results were to be expected.

A retrospective museum of travel and of "tourism" is to be a most attractive feature of the Exposition. It will be a department in the Palais du Génie civil on the Champs de Mars. Efforts have been made to secure a representation of everything possible relating to the history of travel. Examples will be shown of the primitive forms of the diligence, the coach, the wagon, the bicycle, etc. There will also be important collections of maps, prints, caricatures, etc., relating to travel, and the various features will be brought down to present conditions, setting forth the conveniences and comforts of to-day. The automobile, naturally, has a most important place in this department. M. Manceaux Duchamin, 12 rue de Hambourg, is the leading member of the committee on installation.

The horse-census of Paris for this year has a special interest by reason of the growth of the automobile. Contrary to expectation, the number of horses has increased in the past year. The number available for service in case of mobilization of the army is now 98,284, against 93,652 the previous year. Although on various tramway lines mechanical traction has been substituted for animal the number of horses belonging to the great Omnibus Company has increased from 15,833 to 16,838. The various activities in connection with the Exposition are probably responsible for much, if not all, of this increase.

The appearance of that useful publication, *L'Almanach des Sports*, for the twelfth year, deserves mention. Under the direction of Maurice Leudet, it makes a handsome volume of 500 pages, profusely illustrated with original drawings, reproductions of photographs, etc., and with departments devoted to the various branches of sport, each edited by some special authority in his respective field. The automobile department is edited by Paul Meyan and the bicycle by Maurice Chérié. It is almost an encyclopædia of physical culture.

M. Serpollet has installed at his factory in the rue Stendhal a section of track with a 19 per cent. grade for testing his vehicles. Equipped with his celebrated steam motors they find no difficulty in making the tremendously steep ascent and then descending the grade in all security, curbed by an effective brake.

The automobile industry in France is growing by leaps and

The New Sport Abroad

bounds. In 1897 the value of imported "adult" automobiles, as they might be called, was 199,850 francs, while that of the exported vehicles amounted to 623,690 francs. But two years later the imports amounted to 458,000 francs and the exports to 4,260,000. The motor-cycle industry was already well developed in 1897, when the imports amounted to 8,400,140 francs and the exports to 10,076,980 francs. In 1899 the imports had increased only by 422,000 francs and the exports reached 11,280,000 francs.

An experience of the celebrated *chauffeur*, Béconnais, in his recent speeding test on a motor-tricycle—when he made two kilometres in one minute, 42 $\frac{1}{5}$ seconds—indicates that the automobile may yet distinguish itself in fox-hunting! Crossing a tramway line the machine made a leap of five metres and landed on "all three" without mishap.

A novel species of automobile race took place in February under the auspices of France Automobile. The classification was by catalog price, instead of by groups of specifically named vehicles, like *voiturettes*, etc. Group A consisted of vehicles costing to purchasers 3,000 francs and below; Group B between 3,000 and 6,000; Group C between 6,000 and 9,000; Group D between 9,000 and 12,000; Group E between 12,000 and 15,000, and Group F all over 15,000.

The Ministry of War has assigned 157 square metres in the Palais des Armée de Terre et de Mer for the exhibition of military automobiles. The exhibit comprises three groups: Large vehicles built for speed, for despatch work, etc.; transport wagons for heavy artillery; a wagon for the general staff and its ordnance, ambulance and telegraph-service; and third, light vehicles, such as a tricycle with a Maxim gun intended to run to the front with the greatest speed.

A company has been organized for a system of automobile communication by omnibus between Puy-de-Dôme, Cantal, Lozère, Haute-Loire, Creuse, Aveyron, Indre, and Haute-Vienne, and perhaps also between La Loire, l'Ariège, le Gard, le Lot, and la Corrèze. Our highways are so good all over the country that we may expect to see such lines in the near future forming a network of local transit in every district.

M. Charles Jean, the civil engineer, recently contributed to *Le Génie-Civil* a careful study of the transit conditions in and about Paris. He concludes that the future of local transit depends upon automobilism without rails, since it will be necessary to confine all rail-traction within the city to routes either carried underground or elevated above the surface.

The racing season at Nice was opened early in February by

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the contest for the Chaucard cup. It was so early in the season and the weather was so unpropitious that there were only three participants: M. Pinson, M. Gondoin, and "Dr. Pascal"—the latter a pseudonym for Baron Henri de Rothschild. M. Pinson was the winner, M. Gondoin meeting with an upset and "Dr. Pascal" falling behind after taking the lead at first.

The automobile festivities at Nice this year were a great event. They began on March 25 with a floral parade, which was favored by perfect weather and consequently the crowd of spectators was enormous. The vehicles participating were superbly decorated—some with violets, some with lilacs, and others with roses.



Nice, Promenade des Anglais

The various designs included many delightful and unique conceptions. For the long distance races and runs there were two different courses. The racing course for March 26 was from Nice to Marseilles by way of Brignoles, a distance of 201 kilometres, leaving Nice at 7 o'clock in the morning. The second course was for tourists, from Nice to Draguignan, leaving Nice at 11.30 in the morning. On March 27 the courses lay from each of these places back to Nice. The great interest, of course, was centred in the race to Marseilles and return. There were many entries and some of the most famous *chauffeurs* were included. The victors were René de Knyffe and Béconnais, and both made extraordinary records. When Charron went over the same course of

The New Sport Abroad

201 kilometres from Nice to Marseilles in 1898 in 6 hours and 53 minutes it was considered a remarkably fine performance. But this was lowered fifty per cent. by de Knyff, who made the distance in his automobile in 3 hours, 25 minutes and 30 seconds. But even this time was exceeded by Béconnais on his motorcycle, who covered the distance in 3 hours, 23 minutes and 11 seconds. These speeds were the equivalent of an average of a kilometre in but a small fraction more than a minute. The motorcycle record for this course in 1898 was 8 hours and 23 minutes. Béconnais has therefore lowered it 65 per cent. in two years. The fastest express trains between the two cities have taken a good four hours to make the distance which these two automobilists have covered on the common highway in less than three and a half hours.

The great long distance tour of a thousand miles through England and Scotland, instituted by the Automobile Club of Great Britain, will be in progress when this reaches your readers. It will last through the eighteen days from April 23 to May 11. The first day will be devoted to the run from London to Bristol. On April 25 the trip will be made from Bristol to Birmingham by way of Gloucester and Worcester; April 27 Birmingham to Manchester by way of Stafford, Newcastle and Cougleton; on April 30, Manchester to Carlisle by way of Bolton, Charley, Preston, Lancaster, Kendall, Cherwick and Bothal; May 1, Carlisle to Edinburgh; May 3, Edinburgh to Newcastle-on-Tyne; May 5, Newcastle to Leeds; May 8, Leeds to Sheffield; May 10, Sheffield to Northampton; May 11, Northampton to London. The alternate days, as a rule, will be devoted to an exhibition in the city where the tourists stop over. The exhibition in Bristol will thus take place on April 24, in Birmingham April 26, in Manchester April 29, in Edinburgh May 2, in Newcastle May 4, in Leeds May 6 and 7, and in Sheffield May 9. The tour will constitute a trial in which three classes will be represented. The first class represents vehicles entered by manufacturers or their agents, the second class is composed of privately owned vehicles entered by members of the club or persons introduced by members, and the third class special single parts or accessories entered by manufacturers or their agents. In classes one and two the vehicles entered follow something like the French arrangement, Division A. composed of those costing up to £200; B., between £200 and £300; C., £300 to £500, D. everything over £500. and E. motorcycles. In Class 3 the following sub-categories will be represented: pneumatic tires, solid-rubber tires, wheels, axles. Tricycles are to carry one person, quadricycles two, and all other carriages the number for which they were designed, unless they

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weigh over 1,500 pounds net, when they shall carry three persons. A thousand pounds sterling is devoted to prizes, to be awarded by a jury of experts. There will be no speeding whatever, British laws forbidding such a use of the public ways. For those members who care for road-racing the Automobile Club of Great Britain is to hold a long-distance race in Northern France, from some point on the coast to Paris. On the return from the great tour through England and Scotland the vehicles competing will be exhibited at Prince's Skating-rink, Knightsbridge, May 12 to 19.

At Lincoln, England, a local service is to be instituted by a Motor-Bus and Parcel Delivery Company.

An important work on "Motor Vehicles and Motors," from the pen of Mr. W. Worby Beaumont, with chapters by Mr. Dugald Clerk, and a large number of illustrations, is announced at London.

You will remember that there was a great deal of talk a few months ago about the projected automobile tour from Hong Kong to Paris for this year by Dr. Lehwiss of the Automobile Club of Great Britain. It is now announced that he has been compelled to postpone the journey until the spring of 1901, having found it impossible to complete the necessary arrangements in season for this year. While there is no occasion to question the sincerity of Dr. Lehwiss, it is manifest that the scheme is so impossible that the postponement will necessarily be an indefinite one.

The Prince of Wales has joined the ranks of the automobilists and has recently purchased a Daimler carriage of six horse-power. This will give a great impetus to automobilism in England. The Prince has had considerable experience in riding with friends in both France and his own country, and was so pleased with the new form of locomotion that he decided to have his own carriage and run it himself.

A feature of the international exhibition to be held at the great Scotch City of Glasgow next year is a special course for automobiles. It will have for pavement a layer of cement no less than 15 centimeters in thickness. The track will be built with reference to a speed of 56 kilometers, or 35 miles, an hour. The grand stand will have seats for 25,000 spectators. In the judgment of continental experts the design of the track with reference to a speed of 56 kilometers keeps the limit too low for the good sport that we are here accustomed to in that particular. They think it would be better to build it with reference to a speed of 112 kilometers, or 70 miles.

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A recent number of the *Autocar* has a curious story of a revenge played on an automobile by a number of horses. The vehicle in question had a notable liistory, for it had been in use in Cape Colony, the Orange Free State, and the Transvaal. A gentleman had driven to Dulwich in it, putting it up at a livery stable, where it was placed in a coach-house. There came a heavy snowfall and this brought so many horses to the stable for temporary accommodations that several of them were put into the coach-house. "Finding an utterly lone and unprotected autocar in their midst these long-suffering animals appear to have said the one to the other, 'Lo, our enemy! The cart-thing with the caged horse, that skirls, and girrs, and steams, and so frightens the people who sit in carts behind us that in their frantic terror they pull our heads backwards until our necks are nearly broken, and saw our mouths up and down and criss-cross with the steel rod until we suffer much pain. It is not good that our people should be frightened, for in their fright they become mad, and we are much hurt. We will avenge our people, and our sore mouths. Lo! we will bite it.' And one horse straightway bit a mouthful out of the mudguards, and gnawed the end in, removing all the paint and varnish; another whittled free on the upholstery, braid and horsehair stuffing of the seats; while the third mangled the backrests, and chewed down half of the entry door. So did the equines avenge themselves for the many pains they had suffered when the caged horse had frightened their masters."

The third annual German bicycle fair will take place at Leipsic in the last half of next October, and connected therewith will be an international automobile exhibition. Communications are to be addressed "An das Ausstellungs-Komitee zu Händen des Herrn Willy Werner, Leipzig, Salomon-strasse 16."

A club representing a federation of the various automobile clubs in Germany was founded in Heidelberg on February 14. It is called the Alldeutscher Automobil-Club (All-German Automobile Club). There were present representatives of the Deutscher Automobil-Club, the Mitteleuropäischer Motorwagenverein, the Rheinischer Automobil-Club, the West-deutscher Automobil-Club, the Württembergischer Motorwagenverein, the Fränkischer Automobil-Club, and the Bayrischer Automobil-Club. It was agreed that all questions of general importance should be considered by a committee representing all the interests connected with the club. The Deutscher (German) Automobile Club is to stand at the head of the new organization, and have special charge of regulations for racing.

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The Automobile Club of Turin has instituted a race for an Italian cup, limited to the automobilists of that country. Prizes to the value of 2,000 francs are offered.

The recently organized Automobile Club of Rome has one of the most historic of backgrounds for its activities in the scenes of the ancient sport-loving capital whose streets once resounded with the clatter of chariots. The club's headquarters are at 20 Piazza San Marco. Your manufacturers will be interested to learn that the club calls for trade-catalogs.

The Swiss Automobile Club was formed last December, and it now has over 300 members.

In St. Petersburg at the beginning of 1899 there were only 14 automobiles, all motor-tricycles; at the end of the year there were 52. One of the most notable events of the season was a long-distance contest from St. Petersburg to Moscow, in which M. Masi made the distance of 650 wersts in 26 hours and 57 minutes.

The Vienna automobile exhibition is to take place in May under the auspices of the Austrian Automobile Club. In the same month Amsterdam will have an automobile exhibition in connection with a bicycle show.



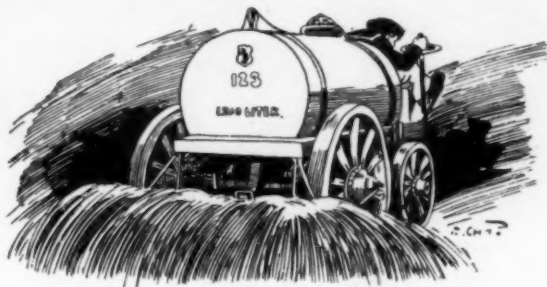
A Chauffeuse in the Bois de Boulogne

The Solar Carriage Lamp

THE Solar carriage and motor vehicle lamp illustrated herewith, is the product of the Badger Brass Manufacturing Company, of Kenosha, Wis. It has the same system of generation that has made the Solar bicycle lamp popular with wheelmen. It has been adopted and used by a number of leading motor vehicle manufacturers during the past year, both in this

country and abroad, and has been found to meet all requirements. It is made wholly of brass and is handsome in design and finish. It is clean and simple in both operation and construction and burns from six to eight hours at a charge. The Special Automobile lamp is finished in all nickel, all brass or black enamel and nickel. It is fitted with a socket on the back to fit a medium-sized finger iron bracket and is intended to be fastened in the middle of the gear or frame. It has red and green side lights. The height is 10 inches. It is fitted with a front lens and throws an intense white light covering all the road.

The square carriage lamp is finished in black enamel, with nickel trimmings. It is fitted with socket on side to fit medium size finger iron bracket made in rights and lefts. Height is 12 inches. It is fitted with lens in front and heavy beveled plate glass sides and rear red signals and built to fill demand for square style lamps. This lamp is suitable for all styles of two-seated vehicles and for Spiders, Stanhopes and motor vehicles.



Gallery of American Automobiles

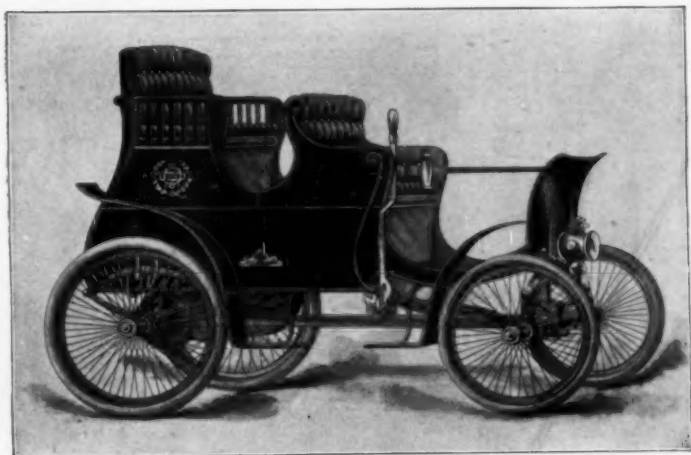


Winton Racer

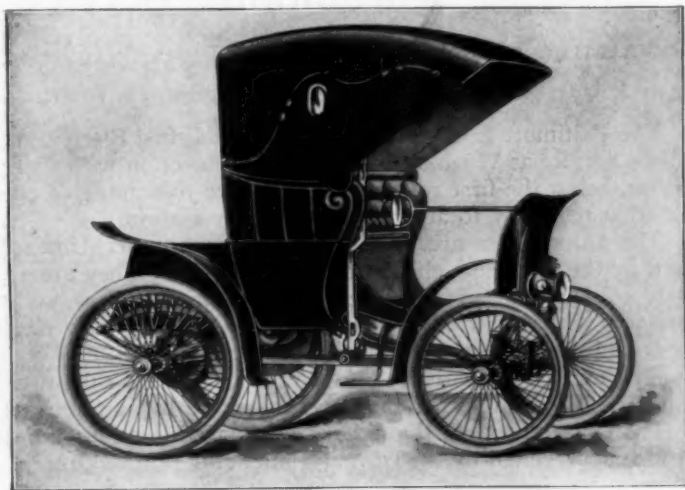


Kensington Stanhope (Buffalo)

Gallery of American Automobiles



Detroit Automobile Company's Surrey



Detroit Automobile Company's Phaeton



Electric Automobile Service

THE BALTIMORE & OHIO RAILROAD THE FIRST RAILROAD TO
INTRODUCE IT

The Baltimore & Ohio Railroad has established Electric Automobile Service at Washington, D. C., in connection with its train service, being the first railroad to introduce this mode of transportation regularly to and from its railway station.

The automobiles are of the latest electric pattern manufactured by the Electric Vehicle Co. of New York. They are absolutely noiseless in regard to machinery and running gear, and are provided with luxuriously deep cushioned seats, with electric lights and time pieces. Two small trunks can be carried on the supports at the rear of the vehicle, and the top of the cab provides ample room for small traveling bags and hand luggage.

The departure from the old style conveyance is marked, and is much appreciated by the traveling public in Washington.

W. Lennard Foote Tire

THIS invention relates to tires for the wheels of vehicles, including bicycles; an object of the invention is to devise a pneumatic tire which shall be durable and easily applied by an unskilled person.

A further object is to obtain all the advantages of an inflated air-tube in a vehicle-tire without having the air-tube in contact with the roadway, thereby also avoiding the possibility of the inflated tube being punctured when the vehicle is in use.

In the present invention use is made of a cork base adapted to be received by the groove in the rim of the wheel, and in this respect the invention resembles that shown and described in the letters patent, granted March 21, 1899, No. 621,451; but in the patented structure there is no pneumatic tube employed as in the present instance, and there are other important novel features embodied in the new structure.

In the accompanying drawings, forming a part of this specification, and wherein like features are indicated by like numerals of reference in the several views, Fig. 1 is a side view of a vehicle-wheel—a tire composed of a continuous base of moulded cork. Fig. 2 is a similar view with the cork base composed of sections. Fig. 3 is a cross-section on the line 3, 3, of Figs. 1 and 2 close to the valve of the pneumatic tube. Fig. 4 is a cross-section on the line 4, 4, of Figs. 1 and 2, showing the bolts by which the tire is clamped to the wheel-rim. Fig. 5 is a cross-section through the cork base and wheel-rim, showing the connection of the spoke to the rim; and Fig. 6 is a detached view of the core resting on the periphery of the cork base and being interposed between the air-tube and the tread of the tire.

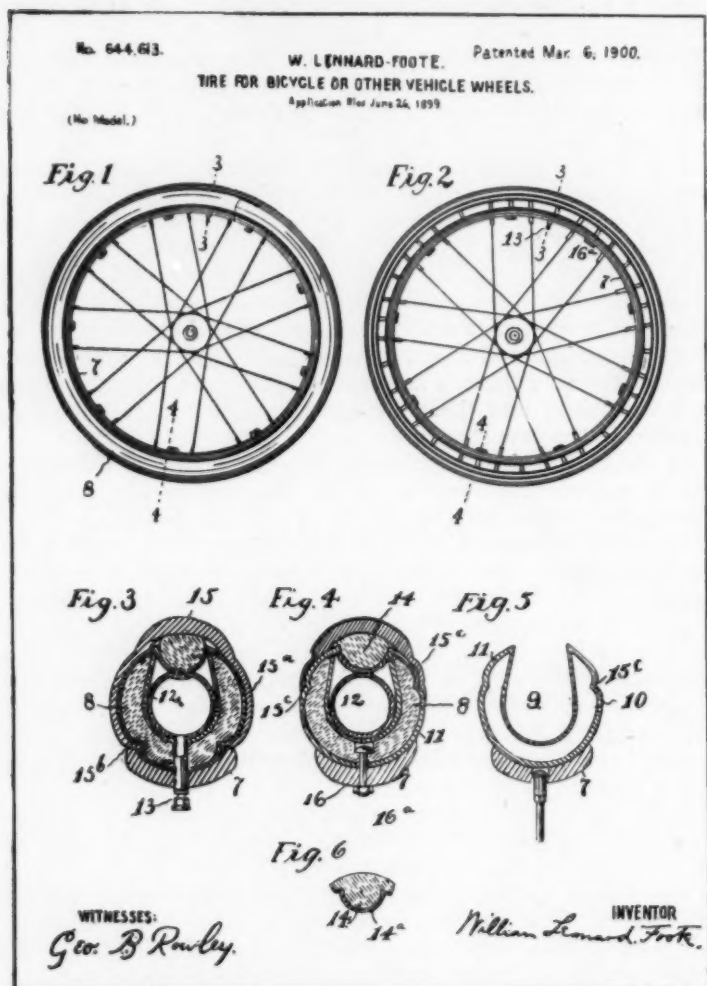
Referring to the drawing, 7 indicates the usual grooved rim of the vehicle-wheel, and 8 a cork base seated in the grooved rim 7. The cork base is provided with a deep channel, 9, and has an exterior surface adapting it to seat snugly in the groove of the rim 7. The cork base may be made either in a continuous piece, molded from cork waste, or in sections of suitable length. When the base is made in sections, there may be placed between the joints of the sections a thin plate or washer, 10, of raw hide to add rigidity and strength to the base.

The cork base is provided with a covering, 11, of canvas adapted to receive a varnish and serving to protect and harden

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the base. The ends of this covering are brought together at the bottom of the channel 9 and firmly cemented in place.

Within the channel 9 of the base 10 there is arranged a rubber



tube, 12, which is adapted to be inflated through the valve 13, connected to the tube and extending through the cork base and wheel-rim. Resting on the periphery of the cork base 8, over

W. Lennard Foote Tire

the top of the channel 9, is a core, 14, which extends into the channel sufficiently to permit the tube 12, when inflated, to bear firmly against it. The core, 14, may be made of cork, rubber, leather, or other suitable material, but preferably of cork, on account of its lightness.

The core 14 may also be provided on its surface with a covering of canvas, 14a, which serves to protect and strengthen the same.

The tread or outer casing, which is in contact with the roadway, is indicated at 15. It is made of rubber; this tread 15 is of a desirable thickness and preferably of the conformation shown in cross-section in the drawings, and it is placed in position over the core 14 and secured in place by having its side extensions, 15a, sufficiently long to extend down to the wheel-rim 7 and enter suitable grooves, 15b, formed in the cork base just within the edges of the wheel-rim 7, the rim 7 being sprung back to permit the ends of the extensions, 15a, to be secured within the grooves. The ends of the extensions 15a may also be cemented within the grooves 15c, instead of having the extensions 15a sufficiently long to reach down to the wheel-rim they may terminate just below the thickened part of the tread 15 and be secured to the cork base by being cemented in the grooves, 15c, formed in the base, as shown in Fig. 4.

The extensions, 15a, of the tread serve not only to hold the tread in place, but also to protect the cork base against injury by stones or the like on the roadway. When the tube, 12, in the channel of the base, 8, is inflated and forced against the core which fills the opening to channel 9, a cushioning support for the tread 15 is provided, since the tread 15 bears directly on the core 14, which is elastically supported by the pneumatic tube within the channel of the base of the tire.

The tire is secured to the rim of the wheel by small bolts, 16, fastened to the base 8 and passing through the rim 7 and provided with screw-nuts 16a, as shown in Fig. 4.

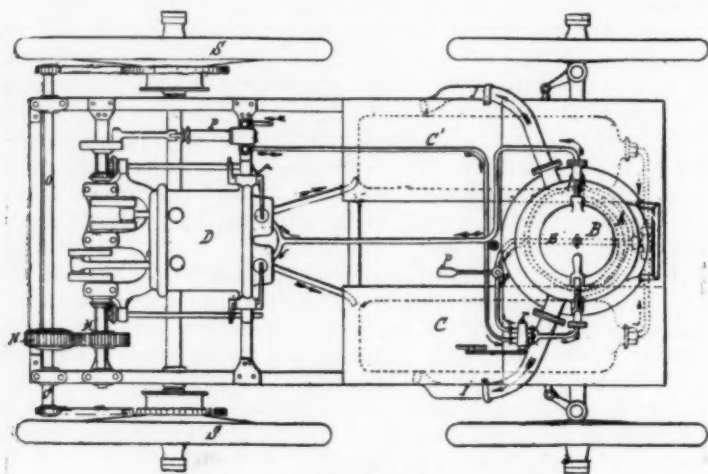
The base of cork is light as well as elastic, both of which are desirable qualities in a wheel-tire. The pneumatic tube being incased within the base is completely protected against puncture, and the core 14, interposed between the protected pneumatic tube and the tread 15, is of sufficient thickness to prevent puncture of the pneumatic tube by any device that might accidentally enter the tread 15. All the advantages of an exposed pneumatic tire are obtained by this invention, with the obvious additional advantages due to its novel construction.

A Carbonic Acid Automobile

By G. Chauveau

FRENCH patents have been granted to Rassinier and Com-melin for the use of carbonic acid gas as a motive power for automobile vehicles. The claims also embrace the employment of compressed air or any other fluid under pressure.

Fluids, such as carbonic acid gas or the air of the atmosphere, lose their heat in expanding from a compressed state, the amount of loss being greater when the pressure to which they are sub-



Plan View of Carbonic Acid Automobile

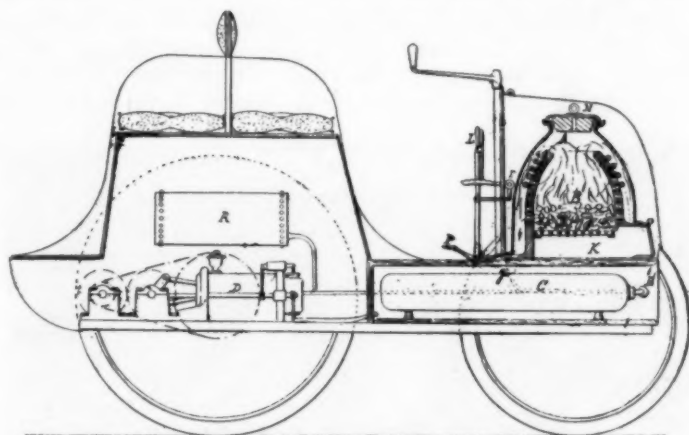
jected is greater. To devise a means which would permit a normal expansion and prevent the loss of heat has been the aim of many inventors. From the innumerable failures and fruitless attempts it might well be thought that the problem was not easily solved. The difficulties which have been met with seem to have been very ingeniously overcome in the invention of Messieurs Rassinier and Commelin.

In the 3 or 4 horse-power vehicle represented in the accompanying elevational and plan views, a coiled, soft-steel pipe with an inner diameter of 6 to 8 mm. (0.24 to 0.32 in.), an outer diameter of 16 to 18 mm. (0.64 to 0.72 in.), and a length of 20

A Carbonic Acid Automobile

metres (65.6 ft.) is connected at its lower end with a feed-pump *P* driven by the motor *D*, and by a branch-pipe *E* with the carbonic acid cylinders *C*. The carbonic acid is introduced whenever desired by opening a valve *g*, controlled by a pedal *p*. The fire-box *B*^s, surmounted by the coiled pipe *A*, receives its fuel through the opening *H*. The products of combustion escape by way of the chimneys *I*; ashes are received by the ash-box *K*; water is supplied by the reservoir *R*, for a purpose which will be later stated.

The motor *D* is a double-cylinder, single-acting engine with no flywheel. To overcome the dead centres more readily three



Side Elevation of Carbonic Acid Automobile

cylinders will probably be employed. The motor-shaft drives the gear *M*, meshing with another gear *N*, controlling the differential mounted on the shaft *o o*¹, with which the wheels *S* are connected by a chain-gear.

Fire having been made and the parts heated to the desired temperature, the valve *g* is opened to allow a certain quantity of carbonic acid to flow into the worm or coiled tube *A*. The admission-valves being opened by means of the lever *L*, the motor will begin to operate. But as soon as the motor has started the pump *P* will begin to force water into the coil *A*. The mixture of steam and carbonic acid thus produced acts as the motive agent. The speed of the motor is controlled by regulating the proportions of the mixture of carbonic acid and steam and its pressure, through the medium of the hand-lever *L* (controlling

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the expansion) and the pedal-valve *g* (controlling the pressure). A gauge is provided to indicate the pressure.

The fire-box with its coil of pipe constitutes in effect an instantaneous generator of steam. To increase the pressure the pedal-valve is operated to mingle more carbonic acid with the steam.

AN IDEAL MOTOCYCLE

The objection has often been urged against the motocycle that it is not a practical vehicle. It is cetrain that if we take into consideration the machines with which such riders as Beconnais, Baras, Osmont and Roland have participated



An Ideal Motocycle

in races, and in which the saddle is reduced to the most rudimentary state and the front seat is still more simplified, and sometimes consists of a mere board, we shall be obliged to admit that they do not form the ideal of a carriage for taking a pretty woman out for an airing. But a glance at the accompanying figure will show that with a comfortable fore-carriage, with ample fenders and with a handsome canvas canopy overhead to protect the complexion of the fair riders against the burning rays of the sun, the quadricycle may constitute an elegant carriage.

A Chainless Gasoline Truck

WE illustrate in the accompanying engraving an automobile truck constructed by Messrs. Dietrich & Co., of Luneville, and designed to carry, upon a level, an effective load of 5,500 pounds at a speed of $8\frac{1}{2}$ miles an hour, and to climb all acclivities up to a gradient of 12 per cent, at a speed of $2\frac{1}{2}$ miles. If the road is good, and the gradients do not exceed 5 per cent., the load can be easily increased to 6,600 pounds.



The dominant idea of the manufacturers has been to construct a vehicle that shall be practical, simple and strong, easy to dismount and keep in repair, and provided with a motor of sufficient power to permit of making an easy start upon the steepest up-grades. The vehicle consists essentially of a rectangular metallic frame, strongly cross-braced, and resting upon the axle of the forecarriage through the intermedium of elliptic springs, and upon that of the hind-carriage through springs with rollers.

Beneath the frame and between the front wheels, which are the steering ones, is installed the gasoline motor, which is of ten horse-power measured at the brake. Above is placed the driver's

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seat, which is protected by a corrugated iron roof and back and side curtains. Within the driver's reach are grouped the starting, braking and change of speed levers, as well as the steering hand-wheel.

The transmissions, which occupy the rear of the carriage, consist of tempered steel gearings, which are fixed upon two horizontal shafts and permit of obtaining speeds of $2\frac{1}{2}$, 5 and $8\frac{1}{2}$ miles, and a backward running of $2\frac{1}{2}$. The first shaft is actuated by the motor through a belt. The second, which carries the differential gear and a band brake, transmits its motion to the rear driving wheels through a system of gearings and jointed shafts that take the place of chains.

This entire combination is protected against dust by iron plate casings that may be easily removed in order to inspect the mechanism. A second brake, which is very powerful, and capable, when necessity requires it, to control the power of the motor, acts upon the toothed wheels of the rear drivers.

Under the driver's seat there are placed: a tool-box; a tank holding 15 gallons of gasoline—a quantity sufficient to permit a run of 90 miles; and a tank capable of containing 8 gallons of water—a supply sufficient for one day's running. Two radiators placed on each side of the truck condense the steam coming from the motor and return the water directly to the latter without the intermedium of a pump.

To the dashboard are fixed: (1) a reservoir of oil for the lubrication of the motor, which uses about a pint an hour; (2) a reservoir of gasoline for supplying the burners; and (3) a lamp.

The lubrication of the mechanism is effected through the intermedium of oil cups provided with siphon wicks.

The effective load is placed upon the floor, which is of oak and rests upon the frame, back of the driver's seat, and is thus almost entirely supported by the driving wheels.

The height of the front wheels is three feet, with a rim of three inches, and that of the hind wheels 3.28 feet with a rim of 3.8 inches. The diameter of the front axle journals is 2 inches, and that of the hind ones 2.4. The hubs are bushed with bronze. The gauge of both the front and rear wheels, from axis to axis of the tires, is 4.1 feet. The distance between the two axles is 7.4 feet.

The truck is 11.8 feet in length and 6 feet in width. The dimensions of the floor that supports the effective load are 8.2×5.25 feet.

The weight of the vehicle, empty and in running order, is about 3,960 pounds.

A Charging Station for Accumulators

THE slab of white marble, diagrammatically represented in Fig. 1, carries all the apparatus necessary for controlling a charging-dynamo and the four charging-divisions. The apparatus and contrivances required for the regulation of the dynamo are a field-rheostat *L*, two fuses *J* and *J*, a cut-out *I*, an automatic circuit-breaker *K*, an ammeter *G*, and a voltmeter.

Each of the groups of apparatus for the charging-divisions is composed of two fuses *E* and *D*, a cut-out *C*, a rheostat *R*, an

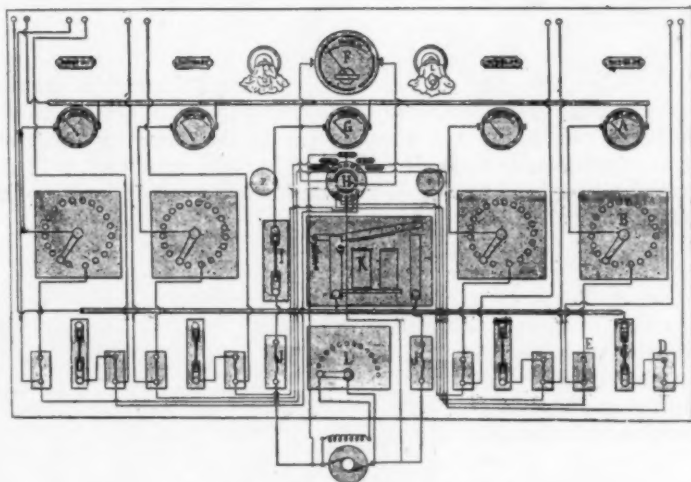


Fig. 1. Diagram of Switch-board.

ammeter *A*, and, lastly, a voltmeter. The same voltmeter can be used for the machine and each of the charging-divisions, by employing a special commutator *H*, shown below the ammeter *G*. By means of the commutator, the voltmeter can be connected with the terminals of the machine and of the battery.

Before describing the operation of the switch-board, a few words on the apparatus of which it is constituted will be necessary:

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Cut-outs.—The cut-outs, *I* or *C*, shown in detail in Fig. 2, serve to interrupt the current by breaking the circuit. They are composed essentially of two pieces, carried by an insulated base.

A good cut-out should have large contact-surfaces, and should permit a very quick breaking of the circuit at two or more points, so as to prevent arcing.

Fuses.—Fuses (Fig. 3) are devices for automatically breaking the circuit if the intensity of the current become dangerous. Every one knows that when a current of a given intensity flows through a metallic



Fig. 2. Cut-out



Fig. 3. Lead Fuse

conductor, a certain amount of heat is produced, owing to the resistance offered by the conductor. If the intensity increases the conductor will melt, if sufficient heat be produced. If the circuit be composed in part of a metal having a lower fusing point than the metal in the rest of the circuit, the excessively strong current will first melt the metal of low fusing-point, thus breaking the circuit and preventing the destruction of the rest of the circuit. Upon this principle fuses are constructed, the metal used in their composition being lead, which has a comparatively low fusing-point. Fuses are composed primarily of insulated terminals connected by a strip of a fusible alloy consisting of two parts of lead, one part of tin, and a few traces of phosphorus. It will be seen from the engraving that the fusible strip



Fig. 4. Automatic Circuit-breaker

A Charging Station for Accumulators

is grate-formed, so as to insure the equal distribution of heat to all parts and prevent the overheating of one part alone.

Automatic Circuit-breaker.—The automatic circuit-breaker serves the purpose of preventing a battery from discharging into

the dynamo, when the electromotive force of the dynamo falls below that of the dynamo, owing to a slackening of the speed of the driving-engine, loosening of the belt, or some other accident. If the dynamo voltage fall below that of the battery, the current flows back with extremely disastrous results for the dynamo. The circuit-breaker is therefore used to cut off the current upon the very first indication of a change in the current's direction.

In the apparatus shown in Fig. 4, the charging-current from the dynamo passes from the left terminal through two electro-magnets grouped in parallel and formed of insulated copper. The current enters this winding by way of soft-iron cores secured to a strip of copper, which also carries the left terminal.

The two windings, on leaving the coils, are conducted to the pivot of a lever.

When the lever is depressed, it closes the circuit, by coming in contact with a fork mounted to the right and carrying the second terminal. Under these conditions the electro-magnet will attract the armature mounted on the under surface of the lever and hold it in this position so long as the current is of the normal electromotive force.

Rheostats.—Rheostats are apparatus which are placed in series on a circuit to vary its resistance, and hence the intensity of

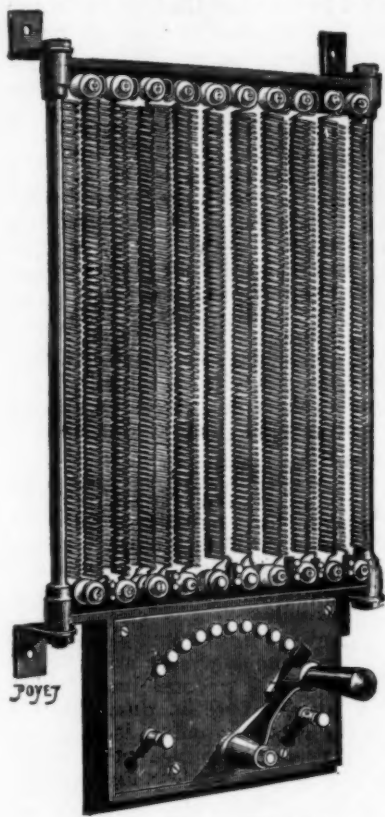


Fig. 5. Dynamo Rheostat

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the current. Fig. 5 shows a rheostat for controlling the fields of a dynamo. It consists of a series of resistances connected with contacts over which a switch-handle plays. The current enters by the handle, passes through a contact and into one or more of the resistances, depending upon the position of the handle on the contacts. By passing the current through few or through many of the resistances, coupled in series, the resistance of the circuit can be varied, as well as the intensity of the current, and hence the excitation of the dynamo. The average current passing through the rheostat has a strength of about 3 amperes and a total resistance of about 40 ohms.

The rheostats *B* used for regulating the intensity of the current sent into the battery are similarly constructed; but their resistance is calculated for intensities varying from 5 to 30 amperes, during the charging of the battery. The rheostats *B* have 20 contacts, one of which is dead. When the switch-handle is on the dead contact, the circuit is broken. The rheostat *L* should not have a dead contact; because the breaking of a current at this point would be followed by dangerous results.

With the apparatus thus clearly before us, we can now proceed to examine the operation of the switch-board.

One of the poles of the dynamo, by means of the fuse *J*, a cut-out *I*, and an ammeter *G*, is connected with a large copper bar which is secured to the rear face of the board. The other pole, by means of the fuse *J*¹ and of the circuit-breaker *K*, communicates with a second bar of copper similarly mounted at the lower part of the board. With these two copper bars the various apparatus of each of the four charging-divisions are connected. For battery No. 4, for example, a circuit is formed consisting of the ammeter *A*, rheostat *B*, fuse *E*, etc. From the lower bar, another circuit branches consisting of the cut-out *C* and fuse *D*, and running to a plug from which the current is taken.

The two plugs which supply the current are wired to a small board, in front of which the carriage is located. The terminals of the small board are directly connected with the terminals of the battery.

A RULING ON AUTOMOBILES

According to a decision of the Treasury Department, owners of automobiles who wish to take them abroad will have to pay a duty when they return with them. This affects Americans who will take automobiles to Paris.



Gardner Serpollet Eight Horse Power Cab

The Gardner-Serpollet Carriage

THE name of Serpollet is intimately associated with the development of steam automobilism. In 1887 Serpollet built a steam-tricycle in which coal was used as fuel. Four years later he constructed several superheated-steam carriages which proved remarkably successful. A few of these old vehicles are said to be still in use. At that time (1891) Serpollet enjoyed the distinction of being the only *chauffeur* to whom the authorities of the City of Paris had accorded the privilege of driving an automobile through the streets. He also took part in the early motor-carriage contests, among others in the Paris-Bordeaux race. Although he devoted his attention to the building of tramways for the City of Paris after his automobile experiences, he never abandoned the idea of producing a practicable steam-carriage. Coal, he soon discovered, could not be used as a fuel in automobiles. Then he tried oil. For three years he labored to devise a means for employing petroleum. His work finally culminated in the system of burners which is now used on all his vehicles. With the assistance of his friend, Gardner, he erected a plant for the manufacture of steam-automobiles, which is one of the most admirably equipped in France.

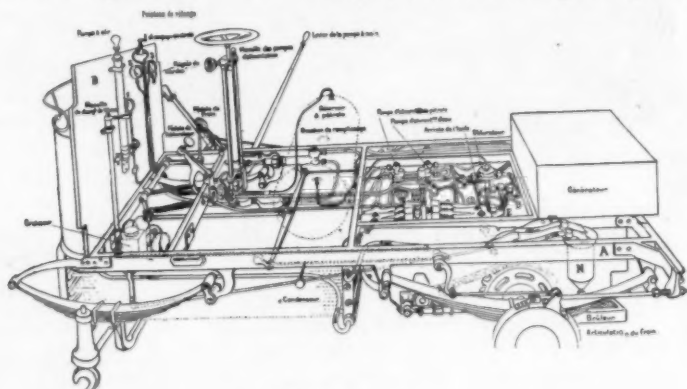
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The Serpollet carriage is distinguished by the use of superheated steam, of petroleum as fuel, of a single-acting engine and of an ingenious system for distributing the petroleum by means of automatic pumps. The impossibility of an explosion and the automatic means for controlling the operative mechanism are features which are also worthy of mention.

SUPERHEATED STEAM: ITS MERITS

First of all it will be necessary to state as concisely as possible what is meant by the term "superheated steam."

Steam produced within a boiler of the ordinary type is called "saturated steam," because it is in contact with the water from which it is generated. If this steam, before entering the cylinder



Plan of Truck

of the engine, be passed through a superheater (an apparatus somewhat similar to a multi-tubular boiler, heated either by the waste gases of a boiler or by a special furnace) it is converted into superheated steam. Its volume increases with the intensity of the heat; and its energy increases with the degree to which it has been superheated. Its economy increases in like proportion.

In order better to explain the reason of this economy, we shall resort to a concrete example. One kilogram of saturated steam at a pressure of 5 atmospheres (159°C.) represents a volume of 317 litres. In order to produce this amount of steam (starting with water at a temperature of 0°C. and at atmospheric pressure), 100 calories are required to raise 1 kilo. of water from its freezing-point 0°C. to its boiling-point 100°C. ; 537 calories to transform this water at 100°C. into steam at 100°C. ; and 18

The Gardner-Serpollet Carriage

calories to raise this steam to 5 atmospheres pressure. Altogether 645 calories are expended.

If this steam be superheated to double its volume, its temperature must be increased by 273°C. , giving $159^{\circ}\text{C.} + 273^{\circ}\text{C.} = 432^{\circ}\text{C.}$ The specific heat of steam under constant pressure being 0.475, it follows that $273 \times 0.475 = 129.675$ calories will be required. Hence $645 + 130 = 775$ calories are employed to produce $317 \times 2 = 634$ litres of superheated steam.

To generate the same volume of saturated steam,

$$645 \times 2 = 1,290 \text{ calories}$$

are necessary, showing that there is a saving of 515 calories or of 40% of fuel for superheated steam.

The Serpollet boiler contains no reserve water and produces its superheated steam directly. Superheated steam has the advantage over saturated steam, as we have seen, of saving from 30 to 35 per cent. (theoretically 40%) of the fuel and of performing an amount of work equal to a weight of water about 50 per cent. less than that employed with saturated steam. Hence the amount of water to be carried is reduced 50 per cent., and the amount of coal 30 to 35 per cent.

These are the advantages of using superheated steam as a motive agent. In automobiles, in which the dead weight and the cost of fuel are the chief factors to be considered, it is evident that the superheated system is the only system which can be economically employed.

The frame of the Serpollet carriage consists of two longitudinal steel beams *A*, V-shaped in cross-section and supported by four springs mounted on wheels provided with pneumatic tires. In the front portion of this steel frame are carried a water-tank of 60 litres (13.4 gals.) capacity, and a board *B* upon which the various pressure gauges, an air-pump (the use of which will be explained further on), and a speed-changing lever are mounted.

The steering-hand-wheel is carried by a standard on which are secured a speed-changing hand-lever and a lever serving to control the water and oil feeding pumps. The petroleum-tank, containing 50 litres (11 gals.) of oil, is located in the centre of the frame.

On the frame are also carried the condenser, the motor *M*, two pumps for feeding oil and water, the steam-regulator actuated by a pedal, the generator (or boiler) schematically shown as a parallelopipedon in the rear of the carriage, and the burner. At each side of the steam-generator is a separator *N*, which removes the oil from the exhaust-steam before it enters the condenser.

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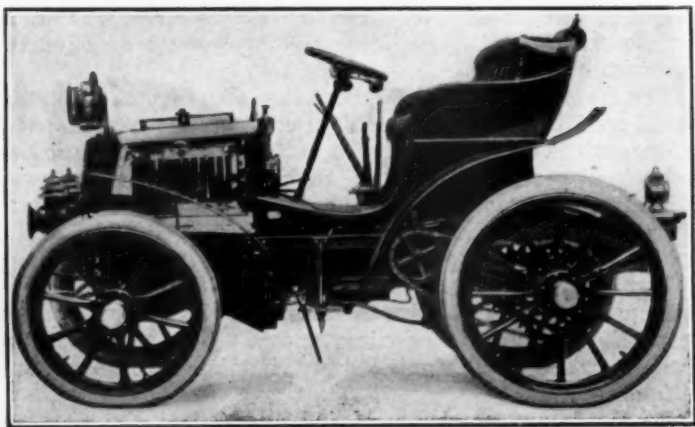
The hand-pump on the board *B* serves the purpose of forcing air into the petroleum tank under a pressure of 100 grammes. This pressure is sufficient to cause the liquid to open a flap-valve in the automatic pump and to flow in a small stream to the burner, where it maintains a low flame when the carriage is stationary or is descending hills.

Three gauges are provided. The first (1) indicates the pressure of the air in the petroleum-tank during a stop; the second (2) indicates the pressure of the petroleum vapor in the worm of the burner, when the carriage is in motion; and the third (3) indicates the steam-pressure.

A cock carrying an automatic safety-valve is secured to the board *B*, to enable the *chauffeur* to empty the generator.

A NEW PANHARD

This is an illustration of a new twelve horse-power Panhard. The novel feature of it is the brake, which is hydraulic in the sense that the brake drum is formed by a rectangular section ring,



which is water cooled, and has the strap so actuated that a pull is obtained on each end, and the brake acts whether the car is running forward or backward. The four cylinders are 90 mm. diameter and 90 mm. stroke.

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Editorial Comment

THIS SEASON'S OUTPUT

The automobile output for the present season in the United States ought to make a very considerable total and give earnest for the extensive preparations set on foot last year. While a good proportion of the various manufacturing companies announced with high-sounding titles and florid prospectuses existed mainly to allure credulous investors by the glamor of a fascinating and popular novelty—and should therefore have been nipped in the bud for unlawful use of the mails—there has been a vast amount of really solid work. The great companies have had much to do in the way of installation of their plants, experimentation, etc., before coming down to actual commercial manufacturing. But, in view of the widely heralded accounts of the preparations in hand, the public has been growing a little impatient of the lack of visible results in the tremendous movement that was so soon to revolutionize the world of highway transportation. Rapid as the change may be, however, it must nevertheless be gradual, and we shall almost imperceptibly see our street traffic transferred from an animal-traction basis to that of mechanical traction. Already the fruits of the extensive prepara-

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tions made are becoming visible, and the beginning of the twentieth century will be likely to see the change far advanced that, within a very few years, must make the ratio of horse-drawn vehicles to automobiles equivalent to that borne by horse-cars to electrics on our street-railways. And the change will be likely to be even more rapid than was that from horse-cars to electrics. This year we may expect to see the gigantic manufacturing plants newly created for the purpose go a long way towards filling the tremendous orders—for many thousands of vehicles in the aggregate—placed with them several months ago. Another great source of supply will be the existing carriage-manufacturing establishments, which are very wisely going into automobile production all over the country. In Amesbury, for instance, the leading carriage-manufacturing town in Massachusetts, they are going into motor-vehicle work very extensively. Another very large contribution to the total output will be the production of the numerous minor plants established for automobile manufacture in countless cities and towns all over the country. On every hand one notes a new automobile factory, until it would seem as if there could be scarcely an industrial community of any consequence in the entire country without at least one establishment of the kind. Many of these have been bicycle factories, and their plants have been easily adapted to automobile requirements. The great bicycle monopoly has made manufacturing unprofitable for the many minor concerns, and very fortunately for them the development of the automobile has come just in time to present a new and more lucrative field in place of their lost one. And unlike the bicycle—enormous though the demand for that has been—there is little danger of the business being overdone for many years to come, for the demand will long continue ahead of the supply. Although the individual output from these minor concerns will be small, amounting in most cases to no more than a few dozen vehicles apiece in the course of the year—the grand total from that source will be something very considerable. And from these plants, largely owned and operated by trained mechanics, we may expect to see American ingenuity make some of the most valuable contributions to the practice of the art.

AUTOMOBILE COAL-DELIVERY

Particularly welcome will be the delivery of coal by automobile. A coal-wagon is at present a terror. When it reaches its destination it requires a deal of maneuvering to get it into place—backing and filling, blocking up the street by drawing square

Editorial

across it, the horses prancing and clattering over the sidewalk to the discomfort and even fright of pedestrians. The suburban resident stands in particular dread of the coal team, which usually cuts up and tramples his lawn, spoils the surface of his driveway, injures paths, ruins flower-beds and mutilates shrubbery, and leaves a scene of general devastation behind. So great is this destruction that the suburban resident is apt to forego the benefits of getting in his winter's coal in the summer, when it is cheap, and put off the evil day as far into the autumn as he dares, so as to bring the infliction of the inevitable injuries at a time when their effect will not seem so disastrous. What a blessed change it will be when an automobile coal-wagon backs up unerringly and without any fuss whatever to just the right spot at the cellar-window, or quietly draws up alongside the curb of the city street, in place of the frantic alarms and the school of profanity that holds a brief but most effective session for the benefit of the children when the drivers endeavor to thwart the horses in their wild attempts to back the heavily loaded cart in every direction but the right one!

AUTOMOBILE PLOWS

Renewed attention is being given to the automobile plow. There have been steam plows in operation for many years, and from time to time there have come reports of their successful introduction on the great farms of the Far West and in California. Dr. Gatling, the inventor of the famous machine gun, has lately been giving his attention to the motor-plow. His work in this direction may perhaps be of greater benefit to mankind than his inventions for the destruction of human life. He does not exactly beat the sword into the plowshare, but he converts the multiple-gun into the automobile-plow, so to speak. The English inventor, Mr. J. E. Stevenson, of Derby, who has given much attention to this subject, states that there are great difficulties in the way. He spent \$100,000 in perfecting a steam digger, which was a great mechanical success but was too costly to put onto the market. The machines are in practical operation and are said to give a wonderfully increased fertility to the soil operated upon. The first attempts in such a direction naturally result in complex and expensive apparatus. Due simplification will follow in the course of time. An automobile plow will always be an expensive implement as compared with the ordinary plow. But its efficiency will be so much greater that it will be economy to employ it. When perfected, perhaps the best course to pursue in making use

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of the invention will be for a number of farmers in a neighborhood to co-operate in purchasing an automobile plow and use it in turn. Or a profitable business might be done by the owner of such a plow in contracting to plow the fields of farmers for them. One such plow should do the work of many ordinary plows with animal traction and do it with much greater trueness. It would confer a great boon upon the horse by relieving him of much of his very hardest and most wearing toil, while, as aforementioned, the deeper plowing of which it would be capable would develop much greater fertility in the soil. We may look to see the successful application of the automobile principle at no distant day not only to the plow, but to various other agricultural operations, such as sowing, cultivating, and harvesting, with consequent economy in agricultural methods and a great lightening of both human and animal toil.

ALCOHOL IN AUTOMOBILE PRACTICE

Some important facts in relation to the use of alcohol in explosion motors for automobile practice have been developed by experiments conducted in France and Germany, and in the latter country alcohol is so cheap as to make it probable that it will be substituted for gasoline there to a very considerable extent. For this country the matter has at present only a theoretical interest, for with the exorbitant price of alcohol here its use for such purposes would be impossible. But should the effort to have the tax removed from alcohol used in the arts succeed the question would at once become practical. Alcohol costs only ten cents or so a gallon to manufacture here, so that but for the outrageous tax on its use in the arts it could be sold much cheaper than in Germany, even. That it is taxed is something greatly to our industrial detriment. Many important forms of manufacturing are impossible here on account of the prohibitive tax on alcohol. With free alcohol in the arts they would at once be established, greatly to the advancement of our prosperity. Alcohol in automobile practice here would give a wholly agreeable form of combustion material for explosion motors and would greatly promote the manufacture of that type of vehicle in this country. Even at a somewhat higher cost, many automobilists would prefer alcohol to gasoline on account of the repugnant odor of the latter. The matter is one of more immediate interest for Germany than for France, because of the greater cheapness of alcohol in that country. But if the price of benzine keeps on increasing as it has been it will soon

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become a practical question in France also. In Germany alcohol is very cheap, and so it looks as if its use in automobile work might become popular there. The German periodical *Kraft und Licht* (Power and Light), gives in a recent number some important details of recent experiments with alcohol. These experiments have been conducted both with stationary engines and with automobiles. Following is a comparison of the two materials according to the analysis of Müntz:

	Petroleum Essence.	Alcohol.
Chemical composition.....	$\left\{ \begin{array}{l} \text{C } 84.3 \\ \text{H } 15.7 \\ \text{O } 0 \end{array} \right.$	$\left\{ \begin{array}{l} 41.5 \\ 13 \\ 45.5 \end{array} \right.$
Specific gravity, at 15 C.....	0.708	9.834
Boiling point.....	88 C	78.5 C
Heat units (kilogram calories)....	11,356	6,522
Relative amount of same.....	100	207
Corresponding heat units.....	100	100

The heat units of the alcohol used in the experiments was somewhat less than in absolute alcohol. In 1897 the experiments made by Prof. Ringelmann of the Agricultural Institute of Paris were not encouraging for alcohol. At the School of Agricultural Industry at Douai, Levy found that one liter of 90 degree alcohol produced 3.5 horse-power hours, while a liter of benzine produced 6.12 horse-power hours. On the other hand, very recent experiments by a motor-constructor showed that with 90 per cent. alcohol a specially prepared motor of 5 horse-power produced from 6 to 6.5 horse-power. Engineer Mora obtained like results.

In Germany, Petreano lately obtained highly favorable results with alcohol. He used an Otto motor provided with a special vaporizer that utilized the heat of the exhaust. With 92 per cent. alcohol the motor used an average of only 540 grams a horse-power hour. Like results were reached with experiments in Berlin. With 90 per cent. alcohol a small Gnome motor used only 300 grams a horse-power hour. Animated discussions have resulted from these various experiments. Friends of alcohol maintain that with Ringelmann the vaporization was defective, and the friends of benzine regard the price of alcohol as too high to make it practicable.

Particularly interesting are the experiments with alcohol for automobile work. The quality used was ordinary 90 per cent. and 95 per cent. alcohol, and also a special carbureted alcohol devised by Dusart, with 30 per cent. of a certain form of hydro-

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carbon mixed with 95 per cent. alcohol. Last November a Dion et Bouton motor-tricycle gave excellent results with this mixture. In December, at the instance of the Society for the Industrial Utilization of Alcohol, M. Krebs, of the Panhard et Levassor Company, experimented with a three horse-power Phoenix automobile, the only alteration being the widening of the opening to the carbureter. With the Dusart alcohol 4.2 horse-power was developed, and with ordinary 95 per cent. alcohol 3.6 horse-power; with benzine at full speed, 4.4 horse-power. According to Araschaquene it would be sufficient to abolish the tax on alcohol in order to cause it to replace benzine.

Perisse reported highly satisfactory experiments with ordinary alcohol tried with a Henriod automobile, although he regards the price as prohibitory for its use in France. He instances the Brist et Armant automobile that made the trip from Paris to Chantilly and back last April under the auspices of *Le Velo*—a distance of 136 kilometers, making the round trip in 8 hours and 8 minutes in bad weather, using 38 liters of alcohol, or an average of 0.30 of a liter a kilometer, corresponding to a cost of 0.21 francs.

In summing up the case, Perisse lays special stress on the advantage of alcohol in producing no disagreeable odor in the exhaust. He suggests experimentation in the direction of utilizing a specially prepared carbureted mixture to be consumed in motors particularly constructed with dimensions adapted to the requirements of alcohol. He recommends, in place of ordinary 90 per cent. alcohol denaturalized with 15 per cent. benzine and green malachite the use of 95 per cent. alcohol, or, better still, 98 per cent., denaturalized with some cheap form of hydrocarbon that in combustion would leave no mineral residuum. In the matter of cost Perisse assumes for France a wholesale price of .60 francs a liter. But in Germany the relative prices are 29 pfennigs ($7\frac{1}{4}$ cents) for 90 per cent. alcohol and 42 pfennigs ($10\frac{1}{2}$ cents) for 95 per cent., while the cost of benzine runs from 46 to 60 pfennigs ($11\frac{1}{2}$ to 15 cents) a liter. So it is claimed that in that country alcohol would have the advantage in spite of the larger quantity required, according to the Müntz analysis. In Germany, therefore, the *Velo* long-distance trip would have cost, instead of 0.21 francs a kilometer, only about half that sum, or 0.087 mark (about 2.7 cents). In that country, therefore, alcohol should have a great future in automobile practice.

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WHEELMAN AND AUTOMOBILIST

The multiplying indications that the bicycle has lost none of its past popularity give increased force to the arguments for better highways. There is little reason to believe that the efforts of the League of American Wheelmen will be less successful in the future than heretofore, but the progress to be made by the League unaided must necessarily be somewhat slow. This fact, coupled with that of the demand, constantly growing throughout the country, for a greater number of smooth and serviceable roads, not only for wheelmen, but for the benefit of all who use four-wheeled vehicles, has led many persons to inquire, Why do not the wheelmen and the automobilists unite?

There are more reasons than one for the belief that such a union would be profitable and would result not only in assuring the continuance of the work for improved roads being done by the wheelmen, but also in expediting it. It is argued that the objects and requirements of the L. A. W. and the Automobile Club of America are coincident in all important respects. Each association is striving for fair treatment, so far as concerns its use of vehicles, and each, primarily, is working for the betterment of the roadways used by the public at large. Many conveniences now enjoyed to a limited extent by cyclists, as, for example, sign-boards here and there in various parts of the country, will appeal forcibly to the owners of automobiles.

Another consideration which argues for the co-operation of the two bodies in question is that the League of the wheelmen has, by reason of its greater age, acquired an experience in dealing with the problems of road construction which should prove extremely valuable to an organization engaged in promoting that work. It has encountered the difficulties which naturally attend such undertakings, and has discovered, at least in a degree, a way to overcome them.

On the other hand, the Automobile Club has set out with a show of ambition which should convince every one that it is prepared to labor industriously and long for the accomplishment of its purpose. Its membership at present contains the names of several men well known throughout the country, and seems likely in the near future to include scores of wealthy and influential citizens. The Club's scheme for a highway to extend across this continent, from Portland, Me., to San Francisco, Cal., with branch roads connecting important places not touched by the main thoroughfare, conveys an idea of the magnitude of its plans.

It is plain that the efforts of the two associations combined

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could be relied on to accomplish great things in the way of road improvement. But, as both have many objects in common, whether they do or do not merge into a single organization, we may be sure that their exertions in behalf of good roads will be effective.—*The Sun*.

The mutual advantages of the suggested co-operation between the League of American Wheelmen and the organized automobile interests are so self-evident that it may be taken for granted that it will be carried into effect. A powerful influence in favor of the proposed national highway across the continent can thus be brought to bear in a way that ought soon to put the magnificent project on the road to prompt accomplishment.—[Ed.]

TECHNICAL DESCRIPTIONS

There are certain difficulties in the way of the publication of technical descriptions of new improvements made by manufacturers, which many who are eager for such information do not appreciate. For example, one eminent manufacturer of automobiles writes us: "As to technical descriptions of our carriage, we think that for the general public such descriptions are confusing, and are apt to deter sales, rather than to make them. Of course there are a number of people who appreciate very much a technical description and want to know all about materials, sizes, etc. We are, however, impressed by the fact that the great majority of people look upon the technical description with distrust, and think they will never be able to handle or operate a carriage of that description." Another great manufacturer writes us: "You speak of a foreign publication having used drawings of our motor with regard to detailed construction. It is not our purpose nor desire to have these detail drawings subjected to publicity, and we presume they must have dug up some old patent records and drawings." Our American manufacturers do not, as a rule, follow the extreme of secrecy in regard to their operations that marks European manufacturers. With all manufacturers, however, there are elements of procedure and detail that it is desirable to keep from the public, and each must necessarily be judge of its policy in matters of the kind.

AN AMERICAN STEAM CARRIAGE AT THE PARIS EXPOSITION

The multitude of things calculated to command the attention of visitors at the Paris Exposition, which opened April 14, will,

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of course, include those designed to excite interest in the enthusiast of the horseless vehicle.

Not the least of these in point of importance is the exhibition of automobiles of American manufacture.

In line with the American instinct of commercial invasion the Locomobile Company of America has taken its sterling product to France "where—we were told two years ago—the automobiles come from." This company has very properly divided its exhibit at the exposition into two sections, one of which is in the Champ de Mars, where eight locomobiles are shown immobile in a space of four hundred square feet. This area is surrounded by columns and arches from which swinging photographs and other decorative matter is suspended. The other section, which occupies four hundred and fifty square feet, and which comprises six carriages, is at Vincennes, adjacent to the track, where the locomobiles are exhibited in motion.

AUTOMOBILE EXPORT

The first shipment of electric automobiles to the Mexican Electric Vehicle Co. was made in the latter part of April. This company, which is a sub-company of the Electric Vehicle Co., will operate a system of public cabs and omnibuses in the City of Mexico under concessions granted in October, 1899, to Charles L. Seeger. The streets of Mexico, being absolutely level and paved with asphalt, are exceptionally well adapted to the use of electric vehicles, and the advent of the automobile in that gay capital is looked forward to with the greatest interest by the inhabitants.

AN UP-TO-DATE RUNAWAY

A curious recent happening in Boston indicates that even as a runaway the automobile is vastly to be preferred to the horse! It appears that a lady had taken an electric cab to make some calls. While enjoying the drive she suddenly noticed that she was passing at considerable speed the door where she had given directions to stop. She signalled the driver and the latter managed to inform her that he had lost control of the power and could not stop. So he kept on out into Brookline, turning in and out of side streets to avoid traffic and running to and fro until the power was exhausted. Then the driver telephoned to headquarters for a relief-cab to tow him in, and the lady took a

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street-car back to town, much annoyed at the loss of her afternoon but thankful for escape from serious mishap. Had such a "loss of control" over the power happened with a horse the chances would have been that the vehicle would have been dashed against something—either a post, a building, or another team—inside of ten rods, with serious injuries, if not death, as a consequence. But in this case not a thing was damaged, either animate or inanimate. So if we must have runaways, let us by all means have them by automobile!

PRACTICAL DETAILS IN MOTOR-CAB SERVICE

Mr. John Love, the founder of the Edinburgh Autocar Company, writes to the *Autocar* concerning his experience as managing director, giving advice as to practical details of operation which should prove valuable for all concerned in that field. He holds that where there is sufficient traffic and the business if conducted on proper lines, nothing should prevent it from succeeding, notwithstanding any fault in construction of vehicles. In such a service, he says, patience is one of the essential virtues. Directors and shareholders have no conception of the work entailed in training and selecting drivers; some men learn quickly, but many are thoughtless and careless, giving constant worry. When anything goes wrong they lay it to the vehicle, and not to themselves; for instance, they think they can drive at the same rate, without damage, over a bad pavement as over good. With common sense, half the battle would be fought. Drivers have to be checked for running along the street-railway track, for this soon cuts up the rubber of the tires. A competent machinist is needed for superintendence and to keep vehicles in repair. Spare vehicles are needed in a ratio of three out of nine. Spare parts are essential and no trip should be made without them. Mr. Love thinks that the driver should be responsible for his vehicle, and that he should oil, grease and wash it. Neither driver nor car should be overworked; six to eight hours a day in driving, and perhaps ten on Saturdays, and no work on Sundays. Working on these lines, Mr. Love says that he was particularly free from accident. But that was in Sabbatarian Edinburgh; in most communities Sunday work would be essential. But nevertheless follow the principle of having a sufficient number of employees so as to provide for one day's rest in seven would doubtless be economical in the end for the company as well as humanely considerate.

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THE HORSE IN FRANCE

It is remarkable how the horse continues to hold his own in France. In this country the bicycle and the trolley-car have had a most depressing effect on the horse-market, and the development of the automobile is certainly not likely to retard that movement, even in France. The industrial growth of a country, however, is naturally accompanied by a growth in the instruments of industry. The horse, of course, still remains one of the chief of such instruments. This accounts for the fact that in Paris, with over 6,000 motorcycles and more than 3,000 automobiles the horse-population has increased very considerably in the past year, as noted by our correspondent abroad in this issue.

SHALL IT BE "MOTO"?

The question of a short familiar name for the automobile has not been much discussed for some little time. A suggestion made, however, by the author, Mr. Nathan Haskell Dole, in a communication to the *Boston Evening Transcript*, is worthy of record. Mr. Dole recommends the adoption of the word "moto" for the purpose. It is certainly both compact and expressive, and since it is not offensive it is infinitely better in that respect than "bike" and "trike." But let us hope we shall not have the motorcycle reduced to "motosike"!

BURGLARY AND THE AUTOMOBILE

Modern improvements unfortunately are liable to perverted utilization as well as for the good of the race. It is only the low average of intelligence among the criminal classes that protects society from extreme harm in the employment of such instrumentalities. The bicycle has, to a considerable extent, become an adjunct in burglary, and we may expect to hear of the automobile being so employed at no distant future. The stealing of automobiles, however, is another thing from the stealing of bicycles. A stolen automobile would be much like a "stolen white elephant," so easily identifiable and recoverable it would be. A recent number of the *Autocar*, however, gives an amusing account of an attempt of burglars in Paris at an automobile manufactory one night. Possibly the burglars had plotted to borrow an automobile for use in their operations. It

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appears that the caretaker at the Krieger factory had his attention attracted by a peculiar noise. "He first of all went into the office and found the place ransacked, and then going into the yard where several valuable electric cars were standing he saw three men, each on a car, trying to make them go. As soon as the caretaker appeared the burglars went for him and tried to stick knives into him, but the knives would not penetrate the thick clothing which he had put on to guard against the rigors of a winter's night. The caretaker yelled, and the burglars made off. The unfortunate man's troubles were not even yet at an end, for while he was congratulating himself on his own escape and regretting the escape of the burglars, he saw one of the electric cars performing strange maneuvers on its own account. It made for the caretaker and knocked him down. The man got up, a little bit dazed at this unprovoked assault, and while trying to collect his scattered wits the car made another attack on him. This time it jammed him against the wall with so much force that he dropped in a heap. He was able to see a man, who had concealed himself in the car, get down and walk away laughing. The caretaker was discovered a little while afterwards lying unconscious, and suffering from severe bruises."

THE "FORE-CARRIAGE" PRINCIPLE

It is noteworthy that one of our highest authorities in physical science, Professor Elihu Thomson, who has given close practical attention to the automobile, has a high regard for the "fore-carriage" principle in motor-vehicle practice, saying that it is to be commended for its application of the motive power at just that part of the vehicle where it is most effective—pulling it like a locomotive, instead of pushing it.

MOUNTAIN AUTOMOBILE STAGE

A project is on foot to construct an automobile road from New York to the mountain region of New Hampshire. John D. Quackenbos, of New York, is the prime mover in the scheme and Governor Rollins and N. J. Bachelder are co-operating with him. The highway would go from New York through the northern part of Connecticut into the Berkshire region in Massachusetts and pass from Vermont to New Hampshire at Bennington. In New Hampshire it would touch the lake region at Sunapee and Winnepeauk, go up the west side of the mountains as far as Lancaster, and then east down through Dixville Notch to the seacoast.

The Automobile Index

Everything of permanent value published in the technical press of the world devoted to any branch of automobile industry will be found indexed in this department. Whenever it is possible a descriptive summary indicating the character and purpose of the leading articles of current automobile literature will be given, with the titles and dates of the publications.

Accumulators—

A serial article, by E. C. Rimington, on the construction and management of electric accumulators for automobiles. "The Automotor Journal," London, March, 1900.

The Majert accumulator fully described and illustrated. "The Motor Age," Chicago, Ill., March 22, 1900.

Description and illustration of the Westinghouse rotary converter for charging automobile storage batteries. "Electrical Review," New York, March 28, 1900.

An Australian Automobile—

More about the Sutton automobile by the inventor, Henry Sutton, A. I. E. E., of Melbourne, Victoria. "The Autocar," March 31, 1900.

Automobiles for Newspaper Delivery—

By E. E. Garrison. "The Automobile Magazine," April, 1900.

Automobilism in Europe—

The principal automobile events in Europe during the Exposition (races and contests). By C. L. Durand. "Electrical Review," New York, March 28, 1900.

Automobilism in Warfare—

(From the "Automotor Journal")
"The Automobile Magazine," April 1900.

Carbureters—

The Longuemare heavy oil carbureter fully described and illustrated. "The Automotor Journal," London, March, 1900.

Description of the Goutallier carbureter. With one illustration. "The Automobile Magazine," April, 1900.

Cooling Device—

Apprin's cooling device for gasoline motors described and illustrated. "La Locomotion Automobile," Paris, March 8, 1900.

Electric Automobiles—

English electrical vehicles. Brief illustrated description of the Electric Motive Power Company's dog-cart. "Industries and Iron," January 26, 1900.

European types of electric automobiles. Illustrated descriptions of vehicles made by several of the more important manufacturers abroad. "Electrical World and Engineer," February 10, 1900.

Illustrated description of the Berthier carriage. "La Machine," Geneva, Switzerland, February 25, 1900.

Illustrated description of the Créanche carriage. "La Locomotion Automobile," Paris, March 8, 1900.

"American types of automobiles." A full description of the Riker vehicles. With illustrations. "Electric World and Engineer," New York, March 24, 1900.

Illustrated description of the Perret carriage. "Electrical Review," New York, March 28, 1900.

The Thresher electromobile brake described and illustrated. "Electrical Review," New York, March 28, 1900.

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"American made electromobiles for 1900." An illustrated description of various vehicles. "Electrical Review," New York, March 28, 1900.

Illustrated description of Lombard-Guerin's automotor trolley. "Scientific American," New York, April 7, 1900.

"An Automobile Patrol Wagon." By H. H. Harrison. "The Automobile Magazine," April, 1900.

Electric Motors—

Description and illustration of the Eddy motor for automobiles. "Electrical Review," New York, March 28, 1900.

A brief description of the Rochester type C motor. With one illustration. "Cycle and Automobile Trade Journal," Philadelphia, April, 1900.

Electric Omnibus—

Description and illustration of the Siemens & Halske omnibus, now used in Berlin. This vehicle is a trolley-car and automobile combination. "Electrical Review," New York, April 4, 1900.

Electric Spark Indicator—

A new device. "The Automobile Magazine," April, 1900.

Evolution of the Motor Vehicle as Shown by Patents—

A technical article (serial) by Leonard Huntress Dyer. "The Horseless Age," New York, April 4, 1900.

Fore-Carriage—

Solignac's Electric Fore-Carriage. From "La Nature." Illustrates and describes an apparatus recently presented to the Société des Voitures Electriques, of Paris. Scientific American Supplement, February 24, 1900.

Governors—

Description of the Joy-Estcourt governor. With illustration showing governor as applied to a single cylinder automobile motor. "The Autocar," Coventry, England, March 31, 1900.

Hydrocarbon Automobiles—

Detailed description and illustration of the "Mees petromobile" and parts of this vehicle and its motor. "The Automoter Journal," London, March, 1900.

Description and illustration of the Ramus voiturette. "La France Automobile," Paris, March 8, 1900.

Brief description of the Gillet-Forest small carriage. One illustration. "La France Automobile," Paris, March 11, 1900.

A descriptive article, serial, on the De Dion-Bouton small carriage. With illustrations. "La France Automobile," Paris, March 15 and 18, 1900.

Illustrated description of the Belgian Duryea carriage. "The Motor Age," Chicago, March 15, 1900.

The latest Audibert-Lavirotte carriage described and illustrated. "La France Automobile," Paris, March 15, 1900.

The Tourand carriage described and illustrated. "The Motor-Car Journal," London, March 16, 1900.

Detailed description of the Hertel motor-carriage. With two illustrations. "The Motor Age," Chicago, Ill., March 22, 1900.

A brief description of the Wilford carriage, made in Belgium. With one illustration. "The Motor-Car Journal," London, March 23, 1900.

Illustrated description of the original Benz carriage, claimed to be the first hydrocarbon automobile ever built. "The Autocar," Coventry, England, March 24, 1900.

"A Gasoline Carriage for Physicians." By Dr. Clarke. "The Automobile Magazine," April, 1900.

Description of the "Luxor" automobile. With two illustrations. "Cycle and Automobile Trade Journal," Philadelphia, April, 1900.

A brief description of the "Eole" voiturette. "The Automobile Magazine," April, 1900.

Illustrated description of the Holley automobile. "Cycle and Automobile Trade Journal," Philadelphia, April, 1900; also "The Motor Vehicle Review," April 3, 1900.

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Illustrated description of the Plass voiturette. "The Automobile Magazine," April, 1900.

The New Decauville voiturette described. With two illustrations. "The Automobile Magazine," April, 1900.

Hydrocarbon Motocycles—

Full description of the Renaux tricycle. With illustrations. (Serial.) By Maurice Chérié. "La France Automobile," Paris, 1900; March, 1, 4, 8, 11, 1900.

Description and illustration of the Lear motor-bicycle. "The Motor Vehicle Review," Cleveland, O., March 13, 1900.

The new Sancione bicycle described and illustrated. "L'Automobile," Turin, Italy, March 15, 1900.

Werner's improved gasoline bicycle described by Maurice Chérié. Two illustrations. "La France Automobile," Paris, March 18, 1900.

Hydrocarbon Motors—

Gasoline motors for Automobiles. George Kellogg Barrett. Outlines the features to be kept in mind in designing a gasoline engine for automobile use. "Modern Machinist," February, 1900.

"Two-Cycle vs. Four-Cycle Vehicle Motors." A technical article by Herbert L. Towle. "The Horseless Age," New York, March 21, 1900.

The Partin motor described and illustrated. "The Automobile Magazine," April, 1900.

Description and illustration of the "Automoto" motor. "The Automobile Magazine," April, 1900.

Ignition—

A technical article by P. P. Nungesser, under the title of "Electric Ignition for Gas and Gasoline Engines." "The Horseless Age," New York, March 14, 1900.

Electric ignition in the Phoenix motor. An illustrated description of same. "The Automobile Magazine," April, 1900.

"Suggestions on Ignition." By Reginald P. Wales. "The Horseless Age," New York, April 4, 1900.

Induction Coils—

A serial technical article on induction coils. With illustrations. By H. E. Wimperis, Wh. Sc. "The Automotor Journal," London, March, 1900.

Lubrication of Motors—

A technical article under the heading of "The Lubrication of High-speed Air-cooled Motors." "The Autocar," Coventry, England, March 23, 1900.

Mechanical Propulsion and Traction—

(Fifth paper). By Prof. G. Forestier. "The Automobile Magazine," April, 1900.

Power Consumption—

A study of the comparative costs of operation and maintenance of horse and electric delivery wagons for city service. By Prof. George F. Sever. "Electrical Review," New York, March 28, 1900.

Power Transmission on Automobiles—

A technical article, with illustrations. "Cycle and Automobile Trade Journal," Philadelphia, April, 1900.

Rules and Regulations for Automobile Club Racing in the United Kingdom (Official)—

They shall apply to all competitions, such as races, record trials and the like. "The Automotor Journal," London, March, 1900.

Speed Changing Gear—

A progressive change of speed, devised by Mr. H. Gerard. "The Automobile Magazine," April, 1900.

Speed Controller—

The Niles speed controller described and illustrated. "Cycle and Automobile Trade Journal," Philadelphia, April, 1900.

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Steam Automobiles—

Description of the Thompson steam phaeton, the first of its kind yet built in Australia. "The Automotor Journal," London, March, 1900.

Description and illustration of Skene steam carriage. "The Cycle and Automobile Trade Journal," Philadelphia, April, 1900.

The Malboro carriage briefly described. With one illustration. "Cycle and Automobile Trade Journal," Philadelphia, April, 1900.

Steam Lurry and Tipping Cart—

Illustrated description of the Mann lurry and tipping cart. "The Automotor Journal," London, March, 1900.

Steam Motorcycle—

Copeland's original motorcycle described, with one illustration. "The Motor Age," Chicago, Ill., April 5, 1900.

Description of the Milne & Killam motor. "Cycle and Automobile Trade Journal," Philadelphia, April, 1900.

The Automobile in Colonial Development—

By Sylvester Baxter. "The Automobile Magazine," April, 1900.

The Construction of a Gasoline Motor Vehicle—

A serial technical article by C. Bramwell. "The Motor Vehicle Review," Cleveland, O., March 13, 20 and 27 and April 3.

The Father of the Automobile—

A biographical sketch of Gottlieb Daimler by Edwin Emerson, Jr. "The Automobile Magazine," April, 1900.

The Jingle of a Joyful Jehu—

By Francis X. Reilly, Jr. "The Automobile Magazine," April, 1900.

The Light Road Carriage—

By Edouard de Norême. "The Automobile Magazine," April, 1900.

The New Sport Abroad—

A descriptive review, with illustrations. "The Automobile Magazine," March, 1900.

The Practical Automobile of the Future—

By E. E. Schwarzkopf. "The Automobile Magazine," April, 1900.

The Street Car of the Future—

An article by Waldon Fawcett, with illustrations. "The Automobile Magazine," March, 1900.

The Use of Balls in Motor Construction—

A technical article, by Henry Souther. "The Motor Vehicle Review," Cleveland, O., February 27, 1900.

Tires—

"Automobile Tires." An illustrated article, by H. Falconnet. "The Automobile Magazine," March, 1900.

A new form of tire for automobiles, invented by Mr. E. Kempshall. "The Automobile Magazine," April, 1900.

Transformable Heavy-weight Vehicle—

Description of Julien Bernard's heavy-weight vehicle. With illustrations. "L'Avenir de l'Automobile et du Cycle," Paris, January, 1900.

Transformer for Charging Ignition Accumulators—

A technical description, with illustration and tables. By A. Delasalle. "The Automobile Magazine," April, 1900.

Transmission Gearing of Motor-cars—

A comparative study by A. J. Wallis-Taylor, C. E. With illustrations. "The Motor-Car World," London, February, 1900.

Transmission Gearing of Motor Vehicles—

A technical article, with illustrations. "Cycle and Automobile Trade Journal," Philadelphia, March, 1900.